Hitchcock's Machine Tool Blue Book

OCTOBER, 1936 THIRTY-FIRST YEAR

Cataract HARDINGE Cataract
PRECISION
Enclosed Head Bench Lathes—Bench Hand Screw Machines—Bench Milling Machines

Typical installations of Modern Hardinge Machines at leading manufacturing organizations
When considering similar machines—make certain you have a Hardinge proposal

HARDINGE BROTHERS, INC., - - ELMIRA, N. Y.
CHICAGO — NEW YORK — DETROIT

BLISHED AT 508 So. DEARBORN ST. CHICAGO

Only MARVEL

Only MARVEL High-Speed Edge Hack Saw Blades can be both high speed and positively unbreakable; can stand greatly increased tensioning, feed pressures and cutting speeds.

Only MARVEL Hand Frames (hot forged aluminum alloy) are absolutely rigid and indestructible; have machine-type clamping blade holders; will truly tension blade taut without distorting.

Only MARVEL Hole Saws have the strength for drill press use, the "set" for deep drilling, a tooth edge of genuine 18% Tungsten High Speed Steel welded to a body of non-breakable chrome-vanadium steel.

Only MARVEL provides a full line of sawing machines from small shop saws to the largest "giant" hydraulic, high speed sawing machines, full ball bearing production saws with automatic bar push up, and a universal band saw—9 outstanding sawing machines.

ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

341 N. FRANCISCO AVE., CHICAGO

Improved End-Mill Performance

WELDON HOLLOW-END

Mill 5/8" diameter, cuts 1/8" deep in tool steel at 360 R.P.M. at a feed of 14" per minute.

Can You Beat It?

1. Stronger Teeth.
2. No Chip Pockets, make this mill 50% stronger than ordinary double end-mills.

THE WELDON TOOL CO.

321 FRANKFORT AVE.
CLEVELAND, OHIO

Pioneers in Fast Spiral Double-end End Mills

Rivett

DRAW-IN COLLETS AND CHUCKS

SPRING TEMPERED

Scientifically heat treated to a true spring temper, "RIVETT MARK" collets resist wear and hold their spring longer than collets of any other make. Carried in stock for all standard lathes and milling machines. *Write for Bulletin 100-B.*

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RIVETT LATHE & GRINDER INC.

BRIGHTON, BOSTON, MASS.

Hitchcock's
Machine Tool
Blue Book

Selected Circulation — 22,000 Monthly

OCTOBER, 1936 — THIRTY-FIRST YEAR

Index of Machine Tool Orders

For August, 1936

The Index of Machine Tool Orders for August was 127.5.

While this is some recession from the previous month, the total value of orders in August was still at the highest level that it has been since 1929, with the exception of June and July of this year.

Inquiries and prospects for the remainder of the year continue favorable, and the outlook is bright for 1937, due to the great accumulation of shortages in the capital goods markets. Many authorities believe that the work of modernizing the plants having equipment which became obsolete during the depression has only just begun.

Published By

Hitchcock Publishing Co.
508 S. Dearborn St., Chicago, Ill.

Consult the Classified Finding Index for your requirements

COLLET AND FEED

Collets for your Lathes and Milling Machines

All types and sizes carried in stock for prompt shipment

Collets for your lathes and milling machines when you want them . . . instantly . . . promptly! HARDINGE Collets—recognized for accuracy and durability since 1890—are held in stock in sufficiently large quantities in Elmira, Chicago, New York, Detroit and Los Angeles to insure immediate delivery at any time.

This prompt service includes HARDINGE Collets for American, Burke, Cataract, Flather, Hendey, LeBlond, Monarch, Porter - Cable, Pratt & Whitney, Rockford, Sebastian, Sidney, South Bend, Sundstrand, Van Norman and all other lathes and milling machines.

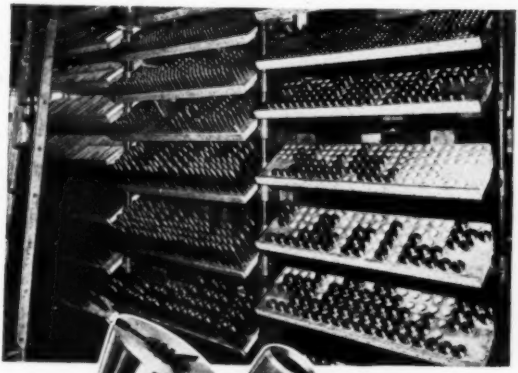
Ask for bulletin No. 36

—ALWAYS SPECIFY HARDINGE COLLETS—

HARDINGE BROTHERS, Inc. - - - ELMIRA, N. Y.

FINGER SECTION

Collets and Feed Fingers for your Automatic and Hand Screw Machines



Standard sizes in stock for immediate delivery

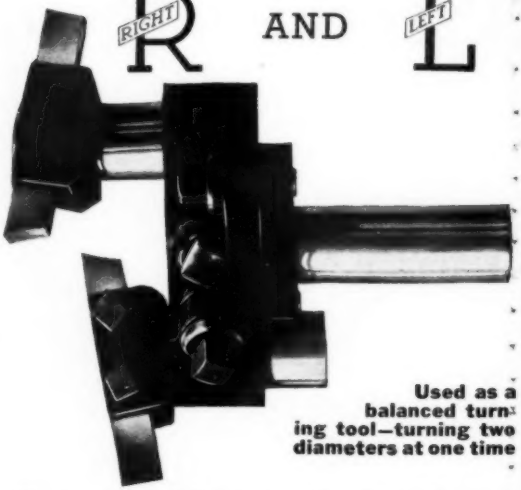
Typical MORRISON quality and quick delivery are planned to meet with the satisfaction of all users of Collets, Feed Fingers and Pads for Brown & Sharpe, Cleveland, Cone, Gridley, National Acme, New Britain, Davenport and all other automatic screw machines. MORRISON Collets also for Bardons & Oliver, Foster, Garvin, Pratt & Whitney, Warner & Swasey, and all other hand screw machines.

Ask for catalog No. 34-A

—MORRISON MEANS ECONOMY AND PERFORMANCE—

MORRISON MACHINE PRODUCTS, Inc., ELMIRA, N. Y.

R AND L



Used as a balanced turning tool—turning two diameters at one time

For roughing and finishing cuts, either right or left hand

The R & L Turning Tool will make quick work of roughing either one or two diameters, used as a balanced turning tool. No special tool bits are required.

Entire tool is made of heat treated alloy steel in three standard sizes or built to order according to your specifications.

This Tool will reduce costs

R AND L TOOLS

Turning Tool

Set for drilling and turning at one operation

Can be changed from right to left hand in ten seconds' time

Save on your Tools. The R and L Turning Tool will do the work of several of your other tools, singly or in combination.

Tantalum Carbide burnishers will not scratch or mar the surface of the work. No rollers to wear or get out of alignment.

Write today for your booklet

Nicetown, Philadelphia, Pa.

KELLERFLEX

single speed, heavy uty machine with a ½ H. P. motor, mounted on a low roller floor stand.

DS-5

A suspended type, direct driven, single speed machine with a ⅛ H. P. motor.

JF-3

A multiple speed machine with a ½ H. P. motor. It is mounted on a roller floor stand which is adjustable in height to suit the job.

FLEXIBLE SHAFT MACHINES

Kellerflex machines are carefully designed and precision built. They contain the finest materials and will give many years of good service. Kellerflex machines all have ball bearing motors, and ball bearing hand pieces that will not heat up in use. On multiple speed machines the jack shafts are ball bearing mounted, and are easily adjustable for proper belt tension. Cables and casings are matched, insuring correct fits and smooth performance, with consequent long shaft life.

Kellerflex machines can be furnished "taylored" for a particular job. This means that the speed ranges can be adjusted to suit individual conditions, and assure efficient operation. This is a valuable feature if your flexible shaft machines are to operate properly.

A wide range of equipment is available for Kellerflex machines, which adapts them to almost any kind of work. It will pay you to know about these cost cutting machines and the work they do. When you think of flexible shaft equipment, think of Kellerflex, made by Pratt & Whitney. Write for free literature.

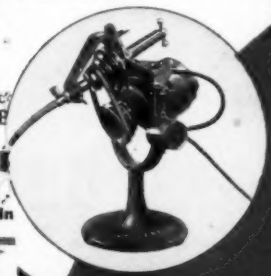
PRATT & WHITNEY DIVISION

NILES-BEMENT-POND COMPANY

HARTFORD, CONNECTICUT, U.S.A.

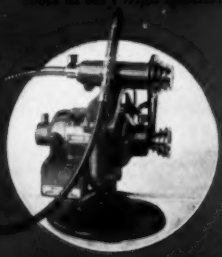
JB-1

A multiple speed bench type machine with a ¾ H. P. motor.

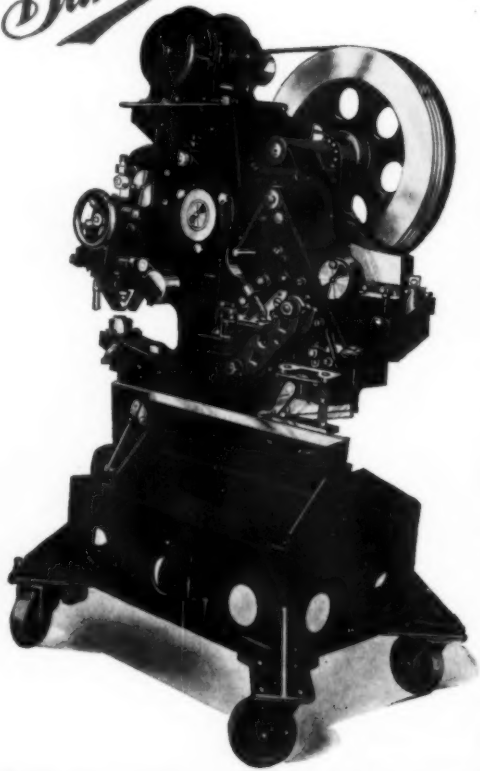


JB-

A small multiple speed bench machine with a ½ H. P. motor. It is capable of using small tools at very high speeds.



"Buffalo" U. I. W.



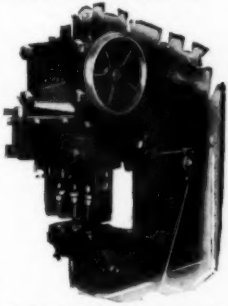
Features new "time-savers"—Built-in Coper and Notcher and Casters for Portability.

Long famous for their speed, power and dependability in cutting rounds, squares, angles, tees, beams and channels and for punching or slitting plates or structural shapes, "Buffalo" Iron Workers are now available with a built-in notcher and coper. These new machines, Nos. 0, ½ and 1½, retain all the solid, sturdy construction features of the standard "Buffalo" models and have the regular punch, shear and bar cutter of the Universal Iron Worker. The notcher is built on the punch end of the machine and is operated either by hand or foot so that the operator may handle all kinds of punching and notching with both hands on the work; coper is on shear end.

"ARMOR-PLATE" FRAME

Guaranteed Unbreakable—Forever!

A new and useful accessory now available with No. 0 and ½ Iron Workers is a set of heavy duty rubber tired casters, which make it easy to move the machine to the work. One Iron Worker can thus serve several departments, or be moved along as a structural job progresses.



Detail of triple attachment and V-notcher in punch head.

WRITE TODAY

for illustrated bulletin showing construction details and uses of Buffalo Universal Iron Workers.

BUFFALO FORGE COMPANY

61 Mortimer St., :-: :-: Buffalo, N. Y.

In Canada: Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

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Places Light Where It Is Needed

Models for Office, Factory, Drafting Rooms, etc., all carried in stock. If your Dealer cannot supply you, please write direct.

Catalog furnished on request.

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1905 **Strand** 1936

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FLEXIBLE SHAFTS AND MACHINES

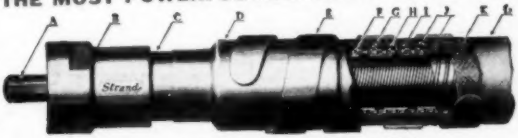
— HIGH QUALITY ONLY —

We Build Machines In Vertical and Horizontal Types ⅛ to 2 H. P. Capacity

Type MB—2 H. P.

You Get Quality Only When You Buy STRAND Equipment

THE MOST POWERFUL FLEXIBLE SHAFT MADE



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FLEXIBLE SHAFT MACHINES

Manufactured by

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No two workmen measure the same thing exactly alike

One measures roughly and another precisely.

That is why FEDERAL DIAL INDICATORS are being used more every day.

They eliminate human variations

Send for special folder showing uses Bulletin No. 43.

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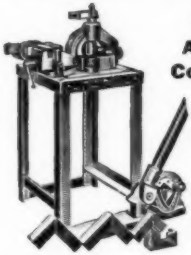
WHITNEY
METAL TOOL CO.



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Angle Iron
Combination

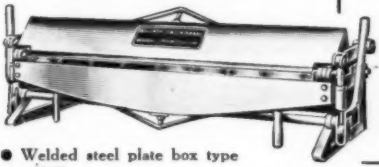
Shears, Notches and Bends a 2" x 2" x ¼" angle iron in one minute flat.

Write for catalog on entire line.

No. 20
Ball Bearing
Punch

Capacity ½" thru ½" iron

Whitney JENSEN *Portable* BRAKE



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BENCH TYPE

Two Models

The Bench Type can be quickly converted to a Floor Type machine by the addition of a sub-base held with 4 bolts.

- Welded steel plate box type jaws.
- Capacity, 49 in. width, 20 ga. material.
- Weight, only **265 lbs.**
- Self-locking clamping handles.
- Can be carried easily by two men.
- Quickly adjustable for different gauges.
- Has every feature of a standard brake.

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The Punch Press Sensation!

SUPER SPEED PUNCH PRESS

No Vibration
INSTANT STOP
Quick Change

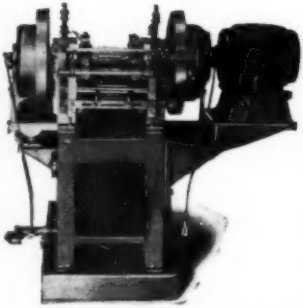
ACCURACY
Feed Control
While Punching

AN ENTIRELY NEW PRINCIPLE

1,000 BLANKS A MINUTE

—ONE DIE—

HOW? By using the SUPER SPEED PUNCH PRESS with its continuous feeder which **never** allows the stock to stop.



No cams, pawls, or ratchets.

The greatest advance in speed since the inception of the Punch Press.

Guides below punch level.

Variable speed control.

Operate with a single die and eliminate the costly "gang" die.

Increased Production—Decreased Die Cost.

YOU MUST SEE TO BELIEVE

Demonstration or Bulletin on Request

SUPER SPEED PRESS CORPORATION
RIVERSIDE, NEW JERSEY

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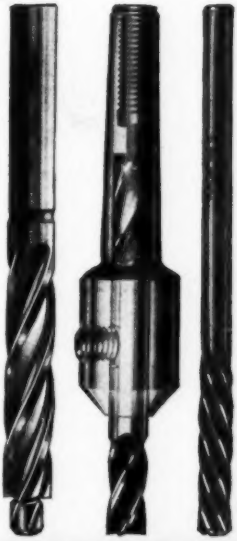
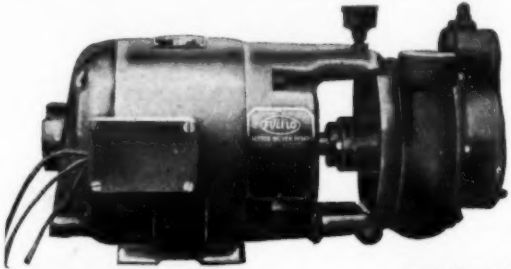
BETTER END MILLS *by* PUTNAM

Here is the new catalog No. 3, 30 pages of valuable information on PUTNAM'S complete line of finest precision tools, including several important new money-saving tools that deserve your careful consideration. The specialized experience of PUTNAM engineers allows us to guarantee these tools unconditionally and to warrant them fully as to quality of material and workmanship.

WRITE to us today
Ask for Catalog No. 3

Putnam Tool Co.
Detroit, Michigan





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TRADE MARK
"FULFLO"
REG. U.S. PAT. OFF.

CENTRIFUGAL WATER PUMP

MODERN

★ DESIGN
★ CONSTRUCTION
★ PERFORMANCE

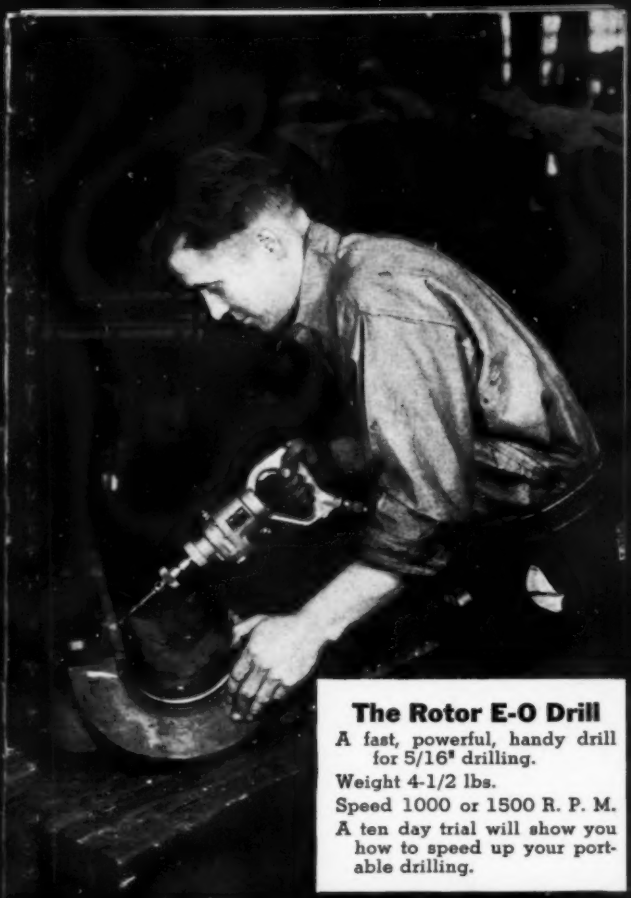
SPECIFICATIONS

¼ H. P.—BALL BEARING—1725 R. P. M. MOTOR
25 GALLONS PER MINUTE WITH 10 FT. HEAD—
IRON BODY—BRONZE IMPELLER—
SPRING TENSION PACKING—
STRAIGHT OR PRIMING COVER OPTIONAL—
PUMP SHAFT REPLACEABLE.

FULFLO SPECIALTIES COMPANY, INC.

BLANCHESTER, OHIO

Detroit, Michigan



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A fast, powerful, handy drill for 5/16" drilling.

Weight 4-1/2 lbs.

Speed 1000 or 1500 R. P. M.

A ten day trial will show you how to speed up your portable drilling.

THE ROTOR AIR TOOL COMPANY
CLEVELAND, OHIO

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NEW 1937 ATLAS CATALOG

Ten minutes with this big new 52 page catalog will save you many dollars in equipment costs this Fall. It's our 25th Anniversary. We're offering the greatest values in our history. Send today for your copy—it's FREE. See all the latest improvements in lathes and drill presses. See how our engineers have combined precision manufacture with modern new design. See the extra features Atlas provides at no extra cost.

A size for every purpose. Model illustrated is back-geared with automatic, reversible power feeds priced at $87.50. Include many features at no extra cost.

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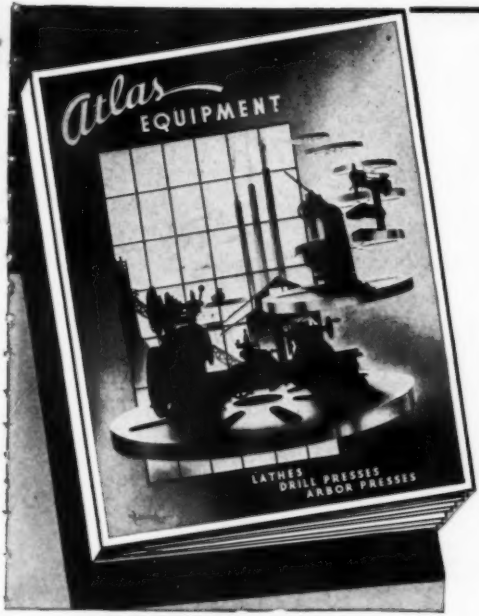

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DRILL PRESSES · ARBOR PRESSES
TOOLS & ATTACHMENTS

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WYCO FLEXIBLE SHAFT EQUIPMENT

1 H. P. Motor
3450 R. P. M.

$105.00
Complete with Equipment as Illustrated

Model No. 4-B

1 H. P. Flexible Shaft Grinder

For Snagging Castings, Grinding Welds, Railroad Work, Etc.

7 ft. Long, Heavy Duty Wyco Flexible Shaft, with 5/8" Dia. Core

Priced Complete with Equipment:
1—6" Grinding Wheel, Aluminum Wheel—guard and 5/8" Wheel Arbor

COMPARE QUALITY! COMPARE PRICE!

Write for catalog showing complete Wyco Line

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642 W. Washington Blvd., Chicago, Ill.

RE-ORDERS: Another proof of DOALL value. American Can bought 4; American Stove 4; General Motors Truck 4; Scovill 5; Crow Name Plate 3; General Electric 10, etc., etc., etc.
In Rockford, Illinois, the city that knows machine tools best, there are 12 DOALLS in use.

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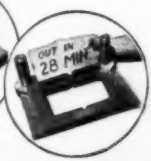
CONTINUOUS INTERNAL AND EXTERNAL

Precision Sawing — Filing and Polishing

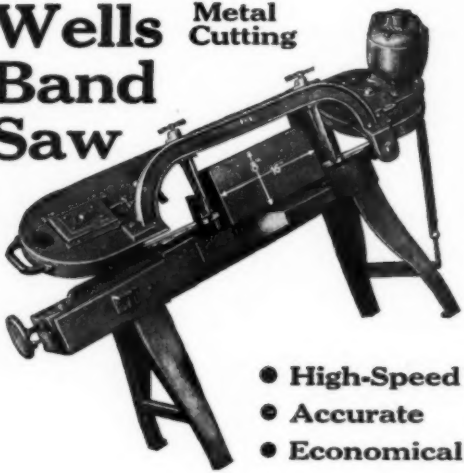
For internal sawing you braze the saw (after one end has been placed thru a starting-hole). So simple a child can make a perfect braze with the "built-in" semi-automatic brazing unit. TIME: Less than three minutes. The braze is stronger than the rest of the saw.



Literature? Tear this out . . . attach to your letterhead and mail.

CONTINENTAL MACHINE SPECIALTIES, INC.
1301 Washington Ave. South, MINNEAPOLIS

Wells Metal Cutting Band Saw



- **High-Speed**
- **Accurate**
- **Economical**

ALL cutting can be done without the use of coolant. Records show 30 to 50% cutting time can be saved with this simple, sturdy, portable machine. Handles any metal, in any shape or thickness up to the generous capacity of the saw. For more detailed information, send for the illustrated booklet.

Built in two sizes
No. 8 capacity 8"x16"
No. 5 capacity 5" rd. or 10"x5"—cuts all kinds of tubing.

WELLS MANUFACTURING CORP.
315 Seventh Ave., Three Rivers, Michigan

SUNDSTRAND INDEX BASES
Cut Milling Costs

Sundstrand Standard Index Base with single-lever control and chip guards

In tooling thousands of milling operations, Sundstrand engineers designed many indexing fixtures of various kinds for cutting costs and increasing production. The features of design developed as a result of this experience are now incorporated in Sundstrand Standard Index Bases. They are available in six sizes ranging from 12"x24" to 18"x36" or 20"x30". Any of these may have the control lever at the operator's right or left so bases can be used in pairs if desired.

They can be furnished with manual or automatic indexing with mechanical, pneumatic or hydraulic actuation. Numerous special applications can be arranged. Speed up your machining operations, cut costs, by using Sundstrand Index Bases. Investigate. Write for Bulletin IB 9-34, today.

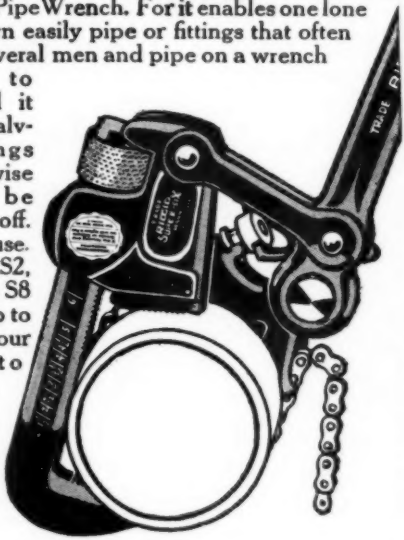
Write for Bulletin IB 9-34 today.

Sundstrand Machine Tool Co.
2535 Eleventh St., Rockford, Illinois

ONE MAN = 6

When he goes after frozen fittings with the RIGID Compound Leverage Wrench

No tool in your shop or kit will pay for itself more quickly than a RIGID Compound Leverage Pipe Wrench. For it enables one lone man to turn easily pipe or fittings that often require several men and pipe on a wrench handle to start—and it lets you salvage fittings that otherwise have to be smashed off. Easy to use. Four sizes, S2, S4, S6 and S8 for pipe up to 8". Ask your Jobber to show you.



The Ridge Tool Co., Elyria, Ohio, U.S.A.

RIGID

Reg. U. S. Pat. Office

Pipe Wrenches Cutters Threaders Vises Extractors

The Facts Prove That This is–

THE GREATEST DRILL PRESS VALUE EVER OFFERED!

$77.50

Without Motor

Overall Dimensions 66" high; 18" wide; 27" front to rear. Tilting table 11" by 12". Production table 12½" by 17" surface. Floor base 10" by 13¾" table surface. Shipping weight 450 lbs.

Write for Name of Nearest Delta Dealer

Read the brief outline of the specifications of this remarkable tool. See if you do not agree. Better still, visit the nearest Delta dealer. See the 17" Drill Press in action. Check it point for point against any drill press you have ever seen. Notice its many new features and special advantages. You will find many ways that this new tool can save money for you.

3½" diam. by 60" column, of heavy-walled tubing, ground and polished to close tolerances.

Five speeds: 385, 600, 935, 1450 and 2240 r. p. m.

Large spindle pulley carried in two self-sealed ball bearings. Exclusive inverted spindle, with automobile-type 16-tooth spline drive, and floating pinion sleeve. Carried in self-sealed, preloaded ball bearings.

Capacity of machine ¾" in cast iron.

Built-in depth stop gage. Depth scale on spindle return-spring housing.

Capacity, spindle to table 34"; spindle to base 44½".

Foot power feed for spindle available.

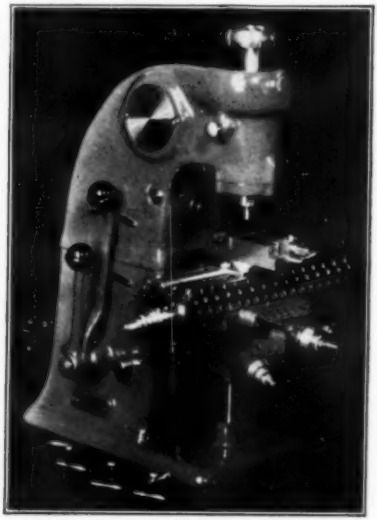
Tilting table standard equipment. Index pin locks table accurately in horizontal or vertical position.

DELTA MANUFACTURING CO.
617 E. VIENNA AVE., MILWAUKEE, WIS.

Hardinge Will Display New Miller

Space L-14 at the National Metal Exposition and Congress in Cleveland, October 19th to 23rd, will contain a display of Hardinge "Cataract" machine tools manufactured by Hardinge Brothers, Inc., Elmira, N. Y. Latest models of bench lathes, hand screw machines and milling machines will be shown.

A new machine will be introduced to the trade with a display of a new precision, vertical milling machine with ball bearing spindle construction for high spindle speeds. The machine is designed for bench mounting, and its modern design and attractive appearance are illustrated in the photograph shown below.



This Hardinge milling machine is expected by its manufacturer to make intricate milling operations on small parts comparatively simple. The illustration shows the vise in place. Index heads, tailstocks,

(*Continued on Page 32*)

DO IT—

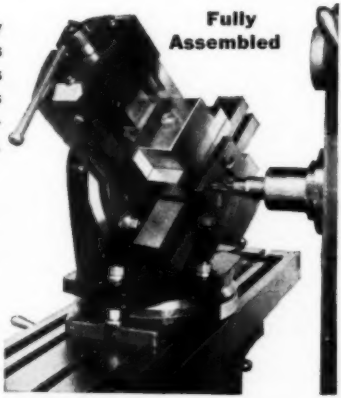
Better—Faster—for Less!

with ODIN UNIVERSAL PRECISION VISES

They quickly pay their costs in savings on High Tool Costs —Expensive Fixtures —Patterns and castings—Extra Set-Ups.

Investigate the money saving possibilities of ODIN VISES

Write today for full facts and prices.



Fully Assembled

ODIN Vises have Interchangeable Jaws, Hardened Ground Parallels, and provide positive clamping at every angle and degree. They are constructed of drop forgings and semi-steel castings and are furnished with Horizontal and Vertical Bases indexed 180°. All parts are interchangeable and all handles are removable. They can be used in part or fully assembled.

ODIN UNIVERSAL CORPORATION

CHICAGO

Sales Division
110 S. Dearborn St.,

Telephone
Franklin 3281

swivel bases, universal adapters, right angle bases, lever feed arrangements and routing attachments are also available.

The spindle construction employs precision preloaded ball bearings of the double row type, providing maximum rigidity with a minimum of friction. Such a design is expected to afford high spindle speeds with extreme precision and to overcome radial and end play, which are a detriment to milling operations.

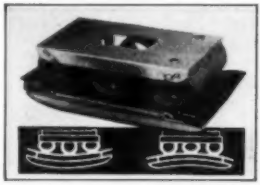
It will be noted that the machine is fully enclosed to exclude dirt and chips and to contain the driving belts to the spindle. An electrical driving unit is mounted under the bench to give eight spindle speeds up to 5,000 r.p.m. The drive does not include clutches, driving gears or loose pulleys. The two levers at the machine provide convenience in the operation of electrical switches for low-stop-high and forward-reverse spindle speeds.

The table working surface is 12 inches by 3¼ inches and the micrometer-controlled travel of the table is 5⅞ inches longitudinal, 3⅜ inches transverse and 5¾ inches vertical. The vertical head has a ½ inch collet capacity for holding milling cutters. The index heads are ½ inch or ¾ inch collet capacity.

The machine has an overall height of 22 inches and requires a bench space of 23x22 inches, which includes the travel of the table.

Sterling Reciprocal Hand Sander

After extensive experiments with sanding and rubbing machines of reciprocating action, the Sterling Products Co., Detroit, Mich., has introduced a sander that is announced as a real achievement.



This machine is driven by an electric motor through a flexible shaft and is intended as a companion to an air driven model manufactured by the same company.

The sanding motion is reciprocal with ⅝ of an inch travel of the sanding

(*Continued on Page 34*)

GROB OPEN END BAND SAW

for

NO WELDING **INTERNAL** **NO BRAZING**

and External Sawing

Set up for internal sawing in 30 seconds. Positive Drive to the saw band insures fast cutting—an exclusive feature.

SEE
EXHIBIT
National Metal Exposition
CLEVELAND
October 19—23

GROB BROTHERS,
West Allis,
Wisconsin

Mail full information to us on the Open End Band Saw and other Grob Modern Die Making Machines.

FIRM .....

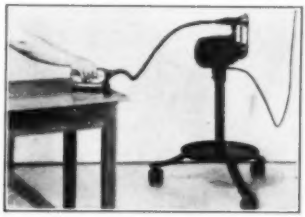
ADDRESS .....

.....

pad at speeds of 1750 to 2800 oscillations a minute depending on the type of work that is to be performed. This movement duplicates the natural back and forth motion of hand sanding and rubbing.

The principle of "floating" as applied to the construction of the block is a patented feature. Flexible rollers of composition rubber and fabric are suspended on pins in the sanding block, so that there is no restriction in the movement of the block and the rollers are enabled to adapt themselves to curved or irregular surfaces.

The machine is designed for wet or dry sanding and finishing, with a water connection and a series of openings on each side of the block. For gas sanding with naphtha, gasoline or benzine, a special block with sterlite base is provided.



From one to five sheets of abrasive may be attached to the pad at one loading. To load the sander, sheets of ordinary size may be cut in three pieces without waste.

The machine is portable and may be operated from any electric outlet in the plant or outdoors.

Three different types of mountings are provided. A bench plate type, with motor mounted on a metal plate, is intended for use on the work bench. A ceiling suspended type has the motor mounted on bale-type handles for use where floor space is limited, and a bench-height pedestal model has a 3-leg caster base that can be easily moved about.

Perfect balance of the sander head and light weight are claimed as additional advantages of the new sander. Dimensions of the head are given as 7 inches long by 4¾ inches high and 3¾ inches wide. Total weight is 7½ pounds.

WHAT A TAPPER

TAPPING PROBLEMS VANISH IN THE FOOTSTEPS OF THE *NEW*

PROCUNIER "TRU-GRIP"

TAP HOLDER— THE MOST SENSIBLE TAP HOLDER THAT EVER GRIPPED A TAP— FURNISHED ON NEW STYLE "E" HIGH SPEED PRECISION

TAPPING ATTACHMENTS

SEND FOR FULL DETAILS

PROCUNIER SAFETY CHUCK CO.

14 So. Clinton St., Chicago, Illinois

Continental Adds New "Doall" Model

Continental Machine Specialties, Inc., 1301 Washington Ave., South, Minneapolis, Minn., has added to its "Doall" line a new model JXD, illustrated below.

Demand for a machine with an extra deep throat capacity influenced Continental engineers to design this new machine, which has all the features of combination sawing and filing for internal and external work that are incorporated in the other "Doall" models.

The table area of model JXD is 22 inches by 30½ inches. The depth of the throat is 25 inches. Both the table casting and the machine frame casting are nickel iron, seasoned with heat treatment to insure accuracy.

To permit easy and exact tracking of the blade, the third idler wheel is made tiltable like the main upper

(Continued on Page 38)

The "JOHN'S" Universal Drill Jig

provides Permanent Jigs at 50% of the usual Jig Cost.

JOHN'S JIGS are made in 3 sizes

6" — 8" — 14"

to accomodate work of almost any size.

6" Jig Illustrated

These JIGS are Standard Equipment in most automobile and other large production plants.

Visibility of your work and plenty of chip room with easy and quick clamping action reduce production costs to a minimum.

Write for literature and send us your drilling and tapping problems for our tooling suggestions

Heuser Manufacturing Co.

1638 N. Paulina St., Chicago, Ill.

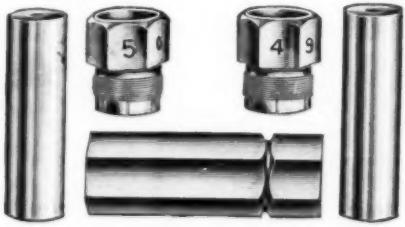
wheel. For the band filing function, an extension section is coupled into the standard Doall file band, to obtain the extra length necessary for this model.

When doing jobs that do not require the extra throat depth of this machine, the third idler wheel is not used.

Exact dimensions and further particulars may be obtained by writing directly to the Continental Machine Specialties Co. and requesting their circulars.

New Plug Gauges Have Many Uses

A new kind of plug gauge with interchangeable ends and extremely fine adjustments was brought out recently by the United Precision Products Co., 4618 W. Huron St., Chicago, Ill.



The five parts of the new gauge are illustrated here. Both "Go" and "No Go" plugs are assembled in collets easily removable from a common handle and may be reversed when worn, thus giving double life. Gauge sizes are conveniently marked on the collets only so that they may be removed with the plug to obtain different combinations.

Plug ends may be used for setting snap gauges or as measuring wires for measuring gear teeth or other parts. The smaller sizes of plug ends may be used as reamers on screw machine work or as accurate perforating punches on small die work.

A wide variety of sizes have been designed for various tolerances. Special sizes will be made to order. Readers may obtain a complete catalog and price list by writing direct to the manufacturer.

SOUTH BEND UNDERNEATH BELT *Motor Driven* LATHE

Model 192-C, South Bend Underneath Belt Motor Driven Lathe 16" swing by 6' bed including Equipment as shown..... **$775**

The New South Bend back-geared screw cutting Lathes are used in leading manufacturing plants, and machine shops for work requiring the highest accuracy and precision in production and tool work. **Write for general catalog No. 95, giving details and full specifications. Sent Free Postpaid.**

SOUTH BEND LATHE WORKS
196 E. Madison St., South Bend, Ind., U.S.A.

PRICES OF OTHER POPULAR SIZES

Size and Type Lathe	Distance Between Centers	Ship'g Weight Pounds	Price Less C'shaft	Price Motor Drive
9" x 3' Workshop Bench Lathe.....	17"	320	$ 75.00	$103.25
9" x 3' Junior Lathe.....	16⅜"	600	182.00	284.00
9" x 3' Standard Change Gear.....	16⅜"	655	237.00	339.00
9" x 3' Quick Change Gear.....	16⅜"	655	277.00	379.00
11" x 4' Standard Change Gear.....	24"	920	304.00	452.00
11" x 5' Quick Change Gear.....	36"	990	356.00	504.00
13" x 4' Quick Change Gear.....	16"	1410	388.00	578.00
15" x 5' Quick Change Gear.....	28"	1460	454.00	685.00
16" x 6' Quick Change Gear.....	34"	2230	536.00	779.00

SOUTH BEND *Precision* LATHES

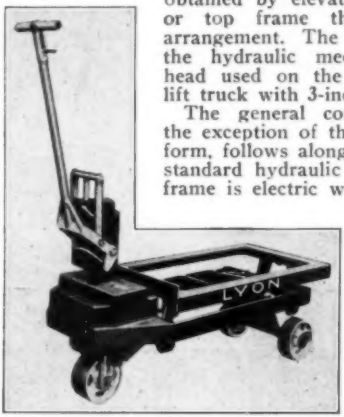
Federal Gauge Has Jeweled Movement

The Federal Products Corporation, 1144 Eddy St., Providence, R. I., manufacturers of precision measuring instruments, announce a new low-friction type of dial indicator which is claimed to mark a decided advance in dial gauges of this type.

Jeweled bearings in the Federal indicator eliminate "bouncing" of the point on angular work and produce steadier dial pointers, quicker reading and quicker handling of the work. A bulletin explaining the advantages of the new gauge is available on request.

New Lyon 10-Inch Lift Truck

The Lyon Iron Works, Greene, N. Y., has developed a hydraulic lift truck with a 10-inch elevation, a model similar to their lift truck with 6-inch elevation. The extra 4-inch lift is obtained by elevating an auxiliary or top frame through a lever arrangement. The head containing the hydraulic mechanism is the head used on the standard Lyon lift truck with 3-inch elevation.



The general construction, with the exception of the auxiliary platform, follows along the line of this standard hydraulic lift truck. The frame is electric welded. The rear wheels are equipped with Hyatt bearings and the front with Timken bearings. Ball thrust bearings are employed in the steering mechanism.

Bulletin No. 109, a folder illustrating new types of Lyon skid platforms, has just been issued. In addition to producing standard models, Lyon has designed many special skids and maintains a design department to produce special skid equipment.

ERRINGTON HYSPD

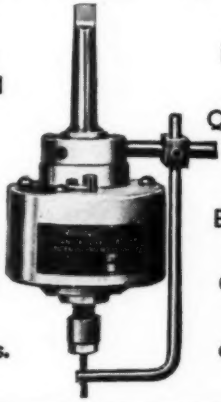
Super-Sensitive Ball Bearing

Cone Drive

2 to 1 Auto-Reverse Tapping Chuck

Combination Bronze & Ball Bearings Thru-Out

Easy and Economical Replacement of Cone-Clutches.



Depth gauge facilitates Quick-Handling Especially on Bottom-Holes

Other Styles and Sizes 0" to 2" taps

Size	Taps in Steel	Taps in Cast Iron	Price	Code
No. 00	0" to 3/16"	to ¼"	$35.00	Phlam
No. 0	to ⅜"	to ½"	$50.00	Phalanx

The principle on which this Style is designed is especially effective on very small tapping; whereas in the **No. 0** size the Frictional Grip is Greatly **INTENSIFIED**, to cover a wider range, without loss of sensitiveness.

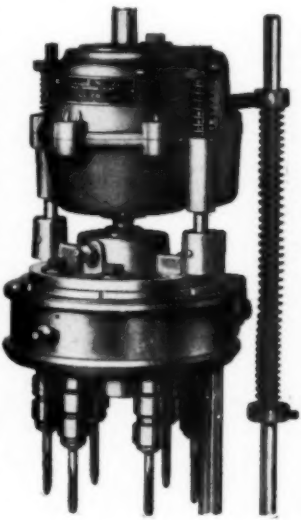
Errington Mechanical Laboratory

Main Office and Works: STATEN ISLAND, New York

Chicago Office: 6047 N. Talman Ave. New York Office: 220 Broadway Boston Office: 930 Old South Bldg.

Ettco-Emrick Tapping Heads

Multiple-spindle tapping heads which can be made up to order from stock parts are being placed on the market by the Ettco Tool Co., 598 Johnson Ave., Brooklyn, N. Y.



With this system of furnishing multiple tapping heads to suit the customer's requirements, a stock case is bored to suit specifications and the stock gears and other parts assembled within the case and made ready for shipment within 48 hours. A friction-driven tapper combined with a faceplate to which the gear case is interchangeably bolted is furnished with this equipment.

A ball bearing faceplate, with Morse shank, can be furnished for using gear cases for drilling. Work can first be drilled and then tapped by changing face plates, but using the same gear case.

The shortest center-to-center distance of the spindles for which stock gears are available is ¾ inch and the shortest possible center distance is $\frac{9}{16}$ inch, any spacing under ¾ inch being furnished to order only. The standard faceplate driving unit is made in four sizes. The smallest size with the case geared 1 to 1 has a capacity for driving two No. 8 or No. 3 taps in soft metal. When the case is geared in a ratio of 2 to 1 the capacity is two No. 10 or four No. 6 taps. The largest size has a capacity for driv-

(Continued on Page 44)

MOST AMAZING SAW

EVER INVENTED

Works like magic. Cuts on a straight line all the way thru—no limit to depth of cut.

The backbone doesn't stop Young Rip.

The old-fashioned limited cut way.

Young Rip Cuts metal, wood, fibre, composition material, insulation, wall boards, any size, any length. The Utility saw of 1000 uses. Easy to handle, quick to finish the job. And NO Breaking of Blades. Cuts with a loose blade that will not snap in half at the first flex.

PAYS FOR ITSELF ON ONE JOB

One difficult job formerly done by acetylene cutting will save more than Young-Rip's cost.

$2.50

including high speed blade

10-DAY FREE TRIAL OFFER

Use Young Rip in your shop for 10 days on any kind of work. Simply clip this ad to your letterhead and mail today.

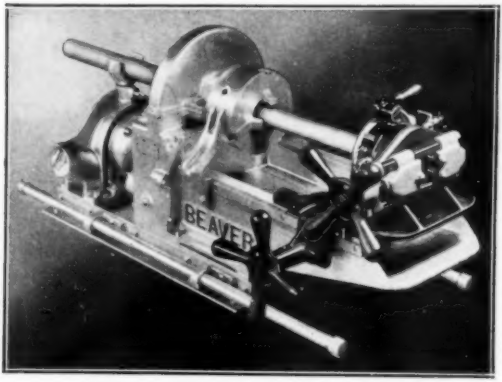
THE H. & P. MANUFACTURING CO.

1639 East 55th St., CLEVELAND, OHIO

ing three $\frac{5}{16}$ or six ¼ inch taps with the case geared in a ratio of 1 to 1. With the gear ratio of 2 to 1, the capacity of the largest size is three ⅜ or eight ¼ inch taps.

Beaver "Special" Pipe Cutter

Illustrated below is a Beaver "Special" pipe and bolt cutter, a variation of the standard Beaver model A. The "Special" model is distinguished from the standard in that it has a wheel and roller type cut-off, while the standard has a knife-type cut-off. Also, the "Special" has a range of ⅛ to 2 inches, while the range of the standard model is ½ to 2 inches. The same threading equipment is used on both machines.



Due to the simple wheel and roller cut-off, the "Special" is claimed to be easier to use, less expensive to maintain and faster in operation than machines equipped with knife-type cut-off devices. In addition, the "Special" will cut off solid round bars up to 2 inches in diameter.

Additional information on both models and data on their attachments and applications are contained in a new catalog which may be obtained by writing to Beaver Pipe Tools, Inc., Warren, Ohio.

If it's better at these 5 points ... it's one of the SKILSAW DRILLS

HERE'S WHY YOU SHOULD CHOOSE SKILSAW DRILLS:

1. SWITCH—Has longer life because of 100% overload capacity and because all the mechanism is fully enclosed in bakelite housing.

2. MOTOR—Its greater overload tolerance minimizes heat and lengthens life. Delivers more power under load.

3. GEARS — Helical cut gears of tougher, stronger steel last longer and run quieter.

4. BEARINGS — Highest quality ground and lapped ball bearings are grease sealed. They are mounted in all positions to compensate for radial and thrust loads,—to minimize friction and eliminate vibration!

5. FRAME — Die cast aluminum frame is more compact, lighter in weight and 50% stronger.

. . . and, in addition, SKILSAW DRILLS are faster, cost less to maintain, save more in operation . . . *yet their price is not higher!* Made in 14 powerful models.

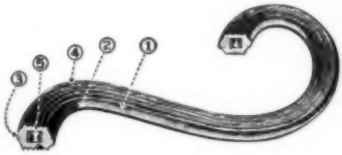
See Your Distributor and Write for Our New Catalog

SKILSAW, INC. 3304 ELSTON AVENUE, CHICAGO
210 E. 40th St., New York—52 Brookline Ave., Boston
312 Omar Street, Los Angeles
Sales & Service for Canada: 85 Deloraine Ave., Toronto

New Drawing Curve is Adjustable

A valuable aid to designers and draftsmen was introduced recently by the Wade Instrument Company, 1663-A East 55th St., Cleveland, Ohio, in the form of the adjustable drawing curve shown below.

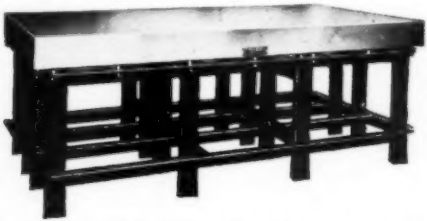
The curve consists of a lead core flanked by two spring steel strips and embedded in a rubber bar. When bent into the desired curve, the lead core keeps the bar in shape, while the spring strips produce smooth, even curves. Low drawing edges along the sides allow the pen or pencil to slide freely close to the paper, while an undercut prevents inkblots.



Prices and complete information may be obtained by writing directly to the manufacturer.

Challenge Co. Has New Layout Plate

A new layout surface plate for accurate layout and inspection work is now being manufactured by the Challenge Machinery Co., Grand Haven, Michigan, which claims that the Challenge plate is a definite improvement over older types.



These new, semi-steel surface plates are especially designed for use in industrial plants that require a

(Continued on Page 48)

SANDING DRUMS
AND
Abrasive Sleeves

NEW!

An interesting
NEW BULLETIN
complete with price information. Write for it today.

Improved Expanding Rubber Drums . . . accurately balanced . . . precision built. Several types for use with different styles of spindles.

Sleeves of new lapless construction . . . last longer . . . do not ravel . . . can be run in either direction.

R. G. HASKINS CO.
4654 W. Fulton St.
Chicago

HASKINS Equipment is ***standard*** equipment in hundreds of industrial plants.

Heavy duty, countershaft type of equipment.

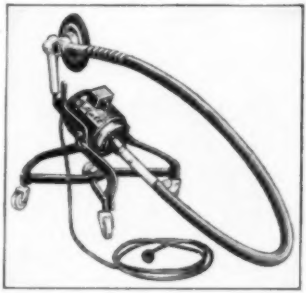
true, rigid, smooth surface for assembly, layout and inspection of products in process.

Challenge plates, the manufacturer states, are planer-finished, smooth, square and heavily ribbed to prevent sagging and are made in standard sizes of 12x18 inches to 48x96 inches. Special sizes can be made to order. The all-steel arc-welded frame is provided with 32 lock-leveling screws.

Plates may be purchased with or without the steel supporting frame shown in the illustration. For prices and further information, write to the manufacturer.

Mall Power-Flex Grinder

The Mall Tool Co., 7740 South Chicago Ave., Chicago, Ill., announces that a new and improved mounting is now being furnished with the Mall Power-Flex utility grinder and polisher.



The all-steel mounting is lower and wider and is equipped with larger, easy-rolling casters.

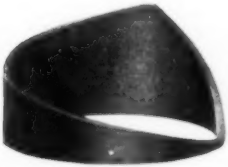
The Power-Flex has a ½ h.p., 3450 r.p.m., repulsion-induction ball bearing motor which is capable of delivering 100% additional horsepower on momentary overloads. The flexible shaft is $\frac{7}{16}$ inch in diameter and 6 feet long and is of the same high quality, according to the manufacturers, as is used in all standard Mall machines. All angle and straight spindles are ball bearing mounted.

The Power-Flex is described as a multiple purpose machine for removing excess metal after welding, for polishing, buffing, sanding and drilling and for general maintenance work.

Descriptive literature on the Power-Flex and on other Mall grinders will be sent without obligation to persons requesting it.

ALLOY STEEL CAMS

FOR AUTOMATIC SCREW MACHINES



Bullard Cams . . . of alloy steel . . . only the path of the roller is hardened about 1/4" deep, body is left soft. If cam has to be placed in new position on drum, holes can easily be drilled.

Cut Off and Form Cams . . . of special alloy steel . . . will absorb any shock, leads are milled accurately, insuring longer life to cutting tools.

Lead Cams with alloy steel face for longer life and accuracy. A comparison of this type cam against other makes proves it is far advanced in principle and lower in price.

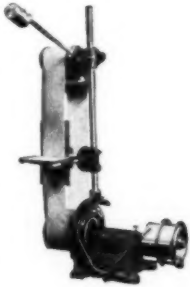
It will pay you well to check up on MODERN Products. These and many other screw machine equipment items are described in our new catalog.

WRITE FOR IT.

MODERN COLLET & MACHINE CO.
401 SALLIOTTE ST. ECORSE, MICH.

Oliver Belt Grinder and Polisher

Illustrated on this page is a new variety belt grinder and polisher introduced by the Oliver Machinery Co., Grand Rapids, Michigan.



The new machine was designed for rapid belt grinding and polishing of all kinds of small and medium size metal pieces of convex, concave or irregular shapes, edge work and flat surfaces. It is especially recommended by the manufacturer for ornamental metal work, metal castings, cast resins, wood and wood compositions.

Construction features of the new grinder include a heavy base supporting a main drive pulley on a countershaft and an adjustable frame swinging about the center line of the countershaft. The frame carries two clamp brackets, one of which supports the top idler pulley and the tension idler, and the other the table and backing plate. The table, shown in a horizontal position halfway up the belt, is made of cast iron, size 10 by 12 inches and tilts up or down 30 degrees. It can be adjusted in or out and has drilled holes for attaching wood tops or forms.

The cast-iron backing plate also can be adjusted in or out to suitable tension on the belt and has drilled holes for attaching flexible pads.

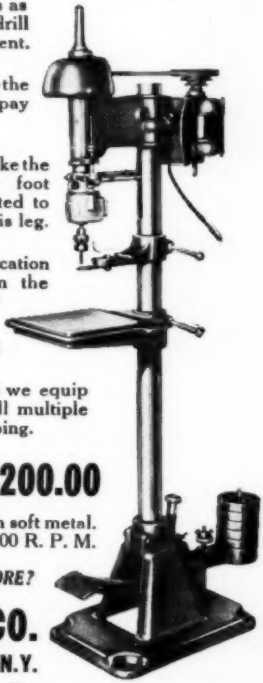
This whole assembly of plates and idlers can be swung right or left with the addition of a fork idler attachment used when grinding oval frames and all irregular shapes. The fork idler is rigid in construction and carries two aluminum idlers which run in ball bearings and are adjustable to the work. Drive pulley and all idlers are rubber faced.

Power for the machine is furnished by a 2 h.p. totally enclosed, fan cooled motor at 900 r.p.m. direct-connected to the lower drive pulley.

Ettco - Emrick

Foot Operated—High Speed—Sensitive

VERTICAL TAPPING MACHINE



Gets out two or three times as much work as the average drill press with a tapping attachment.

•

Tooling charges are low—the built in stripper will alone pay for the machine.

•

And the operator! He will like the effortless balanced gravity foot treadle, which can be adjusted to the weight and length of his leg.

•

Both hands are free, tap lubrication is automatic. Just step on the treadle — tapping will take care of itself.

SKILL IS BUILT INTO THE MACHINE

•

For real production hounds we equip the machine with our small multiple heads—and that IS fast tapping.

•

The PRICE is around **$200.00** according to kind of motor

The capacity is up to 5/16 in soft metal. The speed is from 900 to 2100 R. P. M.

CAN WE TELL YOU SOME MORE?

ETTCO TOOL CO.

598 Johnson Ave., Brooklyn, N.Y.

Errington High Speed Tapper

A new, high speed tapping chuck with cone drive and 2 to 1 auto reverse has been brought out by the Errington Mechanical Laboratory, Staten Island, N. Y.

The new chuck, which is illustrated here, was designed so that all moving parts would be in perfect balance when running at high speeds. Friction cone clutches with approximately 1/16 inch travel from drive to reverse are said to operate without the slightest shock on engagement, while a combination of bronze and ball bearings results in simple design, durability and economy of upkeep. Two styles of these high speed tappers are available. Style H-S can be fitted with a variety of tap holders according to the range of tapping desired, which includes sizes from 0 to ⅛ inch or 0 to ¼ inch. Style C-S has a graduated, adjustable safety-friction in the tap holder itself, where it is said to be most effective in avoiding tap breakage on bottom holes in steel or copper.

Complete data on specifications and adaptations of these new tappers may be obtained by writing directly to the manufacturer.

Wetmore Reamer Has New Catalog

The Wetmore Reamer Co., Milwaukee, Wisconsin, manufacturers of Wetmore adjustable reamers for the metal-working trade, has announced publication of a new, revised, general catalog of their products.

Descriptions of several additions to the Wetmore line are included in the catalog for the first time, together with data on a variety of special tools, standard precision reamers and equipment to reduce reaming costs.

This attractive new catalog, which will be mailed on request, is bound in loose-leaf style to allow for later insertions as additional information is distributed by the Wetmore company.

ANY BOX in the PILE

Instantly Available in the "STACKRACK"

The welded steel Stackracks allow you to pile shop boxes or tote pans ceiling high, still remove any box without disturbing the others.

Designed to lock together as a unit, Stackracks can be used under benches, behind machines, in odd corners. Build an auxiliary stockroom anywhere. Count the low cost against the time and labor saved and you'll agree that a Stackrack installation will lower your production cost.

A Stackrack is made for your boxes or pans. Send the coupon today.

FLEXIBLE STOCKROOM *with* STACKBINS !

Sturdy Steel "Stackbins" or Stackbin Sections may be used as individual receptacles or stacked in tiers to form complete stock cases of any length and height. Seven sizes. Use the coupon.

STACKBIN CORP.

PROVIDENCE, R. I.

COUPON BRINGS WHOLE STORY

Stackbin Corp.
56 Troy St.,
Providence, R. I.

Without obligation, send me literature
☐ on Stackracks ☐ on Stackbins
☐ prices on Stackracks to hold boxes
..... (Give dimensions).

Name .....

Firm .....

Address .....

H & P Co. Designs New Hacksaw

The advantages of "Young Rip" a new kind of hacksaw recently developed by the H & P Manufacturing Company, 1639 E. 55th St., Cleveland, Ohio, are apparent from the accompanying illustration. On a job similar to that shown, which obviously cannot be performed with a hacksaw of the ordinary type, this new tool has a definite advantage. "Young Rip", according to the manufacturers, cuts on a straight line all the way through for any given distance and may also be used on ordinary work which does not require its special shape and construction.

The saw is recommended also for wood, fibre, wall board, composition and other materials of shapes and sizes which cannot conveniently be cut with a saw of the conventional type.

The manufacturers will forward additional information, specifications and prices on request.

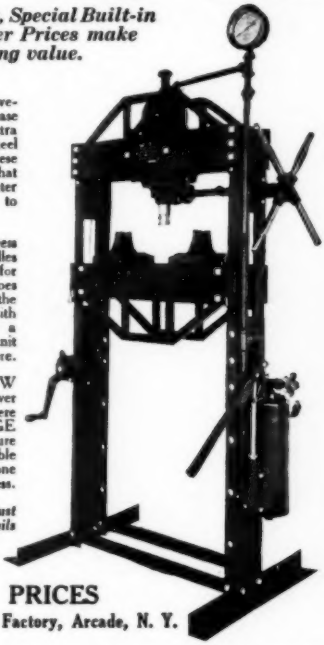
Instructions on Landis Collapsible Taps

The Landis Machine Co., Waynesboro, Penna., has issued an operator's instruction book on Landis collapsible taps.

This free instruction book gives detailed data covering Landis style LT collapsible taps for straight threads and style LM receding-chaser collapsible taps for tapered threads. Ask for it by title.

KRW Hydraulic and Sensitive ARBOR PRESSES

New Improvements, Special Built-in Features and Lower Prices make them an outstanding value.



THE last word in convenience, efficiency and ease of operation. Built extra strong and well braced, with steel trusses electrically welded, these presses will withstand strains that would cause presses of lighter and inferior construction to buckle or collapse.

Hand wheel for sensitive press operations has sliding handles which pull out to the ends for increased leverage. Work does not have to be changed from the work table as is the case with other make presses having a separate sensitive press unit mounted on the side or elsewhere.

The importance of this K R W feature as a time and labor saver can be appreciated. Also there is NO EXTRA CHARGE for this important built-in feature on a KRW Press. Work table can be raised easily with one hand. A strictly one-man Press.

Write for special circular, just off the press, giving full details and specifications of all KRW Arbor Presses.

PRICES

F. O. B. Factory, Arcade, N. Y.

No. 37—35 ton Hydraulic and Sensitive Arbor Press	$135.00
No. 37E—50 ton Hydraulic and Sensitive Arbor Press	164.00
No. 37F—70 ton Hydraulic and Sensitive Arbor Press	275.00

Gauge and fittings, $15.00 extra on all presses.

K. R. WILSON

10-16 Lock Street, Buffalo, N. Y., U.S.A.

EXPORT DEPARTMENT
90 West St., New York, N. Y.

WEST COAST BRANCH
722 Mateo St., Los Angeles

New Trade Literature

In addition to a variety of end mills, reamers and counterbores, a new catalog issued by the Putnam Tool Co., Charlevoix, Michigan, lists many sizes of end mill holders.

The end mills are available for double end mills with shanks from $\frac{3}{16}$ to 1 inch in diameter. Another style with pin drive is available for single end mills with $\frac{7}{8}$ inch shank or larger.

This 32-page catalog showing the complete Putnam line will be sent free on request.

If you are interested in dial gauges, write to the B. C. Ames Co., Waltham, Mass., for a copy of their new catalog No. 51. It's a handsome, 36-page job containing some excellent illustrations and explanations of Ames dial gauges, micrometers, thickness measures and pocket gauges and gauge mounts.

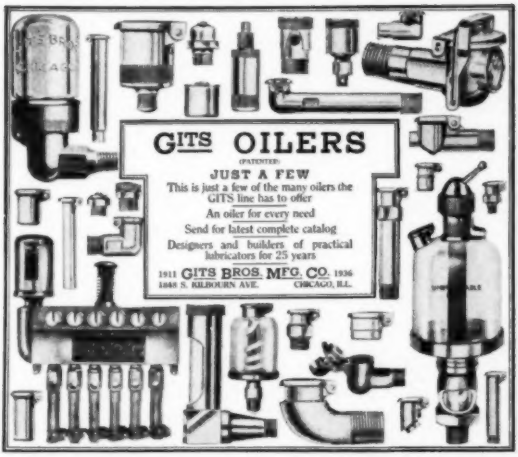
Gits Brothers Mfg. Co., 1848 S. Kilbourn Avenue, has issued a colorful new catalog of their Tru-circle precision high speed felt oil and grease seals. A series of blue print illustrations showing applications of several types of diaphragm and combination oil seals will be of assistance to manufacturers who frequently install this type of equipment. Complete lists of types, sizes and prices are included in the catalog which is available free on request.

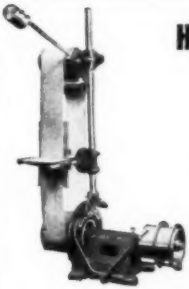
Forty new items and eighteen improved models of Beaver pipe tools developed since 1929 by Beaver Pipe Tools, Inc., Warren, Ohio, are described in a 40-page catalog issued recently by that company. In writing for your copy, ask for Catalog No. 37.

The Clearing Machine Corporation, 6499 W. 65th St., Chicago, Ill., has issued two comprehensive catalogs on their lines of heavy machinery.

Bulletin No. 201, a 24-page illustrated catalog titled "Clearing Crankless Steel Power Presses" deals with a variety of sizes and types of heavy presses.

Bulletin No. 202 is an 8-page folder illustrating models of Clearing Single Action presses with 1, 2 and 4-point suspension and capacities of 50 to 3000 tons.





Here's your machine for grinding and polishing those flat, curved and irregular surfaces

Handles a wide range of work. Extra good for grinding and polishing irregular shaped pieces of small and medium size — concave and convex surfaces, ornamental metal, mouldings, etc. Ball bearing idlers, roller bearing countershaft. Easy to set and operate. Also furnished motorized. ***Write for details.***

"Oliver" Variety Belt Surfacer

OLIVER MACHINERY CO., GRAND RAPIDS, MICH.

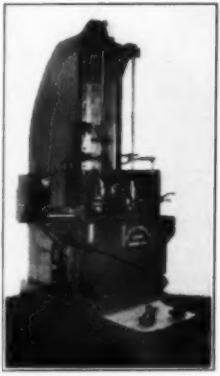
Conway Introduces Heavy Duty Clutches

Interesting engineering data on heavy-duty clutches has been gathered together in Bulletin L 28, a new publication issued by the Conway Clutch Co., 1500 Queen City Ave., Cincinnati, Ohio.

Since the heavy duty equipment was added only recently to the Conway line, this bulletin should be of interest to manufacturers using heavy machinery.

Colonial Solves Production Problem

An interesting solution to the problem of finish broaching round holes accurately in a rough casting was devised recently by the Colonial Broach Company, Detroit, Mich.



The problem results from the tendency of a broach to follow the out-of-line condition if the hole is not true.

This tendency was overcome, according to recent information, through the use of splined broaches passing through the work twice. Between the two strokes the broach is rotated 30 degrees, so as to remove the material left from the first broaching stroke.

In one application, the hole to be broached was four inches long with a diameter of 1¼ inches and a tolerance specification as to size and straightness of within 0.002 inches. The illustration shows the Colonial machine, fixtures and broaches supplied for this operation. The machine is a single-ram, 15-ton machine equipped with two fixtures for right and left hand parts. Above and below the work pieces, bushings are provided to prevent deflection of the broach in operation.

After the first stroke the broach is drawn back through the spline, which it has cut. At the end of the stroke tripping of an air valve automatically

(Continued on Page 60)

Ryerson Horizontal Drilling, Boring *and* Tapping Machines

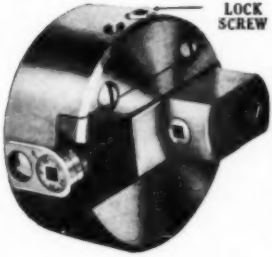
Greatly Reduced Prices

These machines will handle the large difficult drilling and boring jobs easily—and the average run of work very efficiently. The moveable work table together with the great vertical travel of spindle permits work over an extremely large surface.

To reduce present inventory we are offering these machines at very attractive prices. Take advantage of this money saving opportunity. Write today for complete description, specifications and prices.

Joseph T. Ryerson & Son, Inc.
Lock Box U, Chicago, Ill.

FLYNN MICROMETER OFFSET BORING HEADS



No. 30

This dovetail designed head is particularly useful where a large offset is required. Body is solid steel, dovetailed hardened tool holder has 2½" offset. Tension gib and locking device takes strain of micrometer screw. Dial graduated in thousandths, 50 thousandths to a turn, insuring accurate adjustment in boring. Bar capacity is ¼-¾.

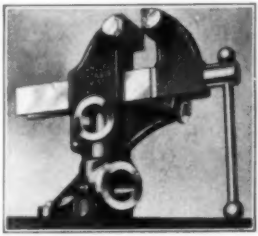
Write for information on other styles and sizes

FLYNN MANUFACTURING CO.
435 Bates St., Detroit, Mich.

indexes the fixtures. At the end of the second stroke the fixture automatically returns to the first index position. Production rate is 180 pieces an hour with a 48-inch stroke. The parts broached are small malleable iron castings.

All-Angle Vise Is Mounted on Post

Many convenient features are embodied in an ingenious new bench vise that permits almost instantaneous locking of the work at any angle in any of four different planes. The vise is manufactured by the Police and Sportsmen Supply Co., 349 S. Vermont Ave., Los Angeles, Calif.



This flexibility is made possible by the use of a tubular post on which the vise revolves. The post can be used in a vertical or horizontal position, and the vise can also be used straight up or sidewise in either position of the post. Closing the jaws on the work automatically locks the tool in the desired position, or it can be locked by tightening the thumb screw at the front. The post is secured in either position by a pin.

This all-angle portable vise is termed by the maker a precision tool of accurately machined alloy steel castings. Two sizes are available in either a woodworker or a machinist model with removable hardened steel jaws 2½ or 3½ inches wide. Jaws are made interchangeable to accommodate all kinds of work.

Reed-Prentice Appoints Cleveland Agent

The Reed-Prentice Corporation, Worcester, Mass., has appointed L. H. Mesker, 920 Hollenden Hotel, Cleveland, Ohio, exclusive sales agent for its line of engine lathes, production lathes, die casting machines and injection molding machines.

Plug Gauges

Show Instantly any Error in Diameter of Holes

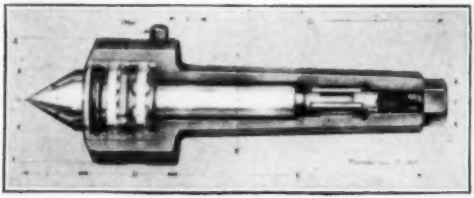
Duplication and the manufacture of interchangeable parts demand strict accuracy. Avoid costly errors and extra finishing operations by equipping your shop with accurate plug gauges.

Sizes range from .030" to 1.000" by .0001", conveniently marked on removable collets. Plugs ends may be reversed when worn to give *double life.*

Send today for catalog and price list

United Precision Products Co.
4618 W. Huron St., Chicago, Ill.

NIELSEN HEAVY DUTY LIVE CENTERS



Here is a tool especially adapted for unusually heavy work. It is equipped with a combination of precision type roller and ball bearings to assure the rigidity and maximum capacity for high speed production and longest possible service.

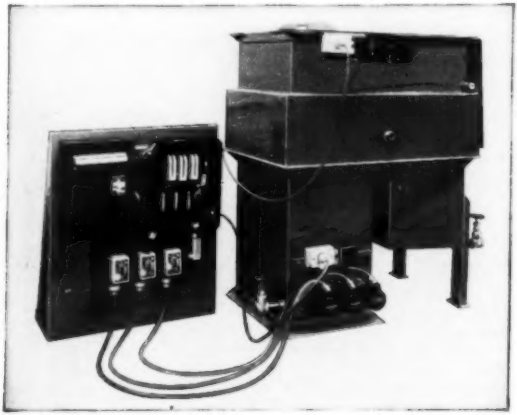
Bearings can be renewed if necessary at slight cost. Tests in your machine shop will quickly demonstrate the precision, low maintenance cost and the durability that have established the "Nielsen" reputation. Write for catalog showing our line of improved live centers and tailstock spindles, with adjustments to take up wear and preload the bearings.

NIELSEN, Inc., Lawton, Mich.

Detrex Solvent Degreasing Machine

A two-dip solvent degreasing machine, designated as Size 624, has been added to the line of Detrex Degreasers manufactured by Detroit Rex Products Company, 13000 Hillview Avenue, Detroit, Michigan.

Among the important features of this machine are a water jacket type of condenser completely encircling the machine, and a solvent collecting trough located directly beneath the condenser. By this arrangement of the condenser and condensate collecting trough, the solvent vapors are held within the machine and all of the pure solvent distillate is emptied directly into the second or rinse chamber, thus continuously renewing the rinse chamber with pure solvent.

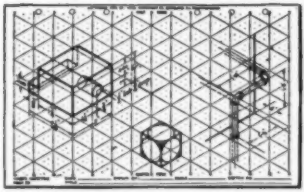


With this type of degreasing machine, the work is usually handled manually in baskets or on racks. For convenience, especially when comparatively heavy loads are cleaned, a small hoist may be employed.

(Continued on Page 64)

ISOMETRIC SKETCH PAPER

Lined for making sketches in three dimensions



Shows all SIX views and INTERIOR in one clear picture. ACCURATE length, width and height guide lines divided 1°, ½°, ¼°. Blue hairlines, HARDLY NOTICEABLE on drawing or blueprint. All lines are the SAME scale; in foreground and background. ANYTHING can be drawn in less time and space this easy way. Popular for instrument or freehand drawing; in Office, Plant, Field. Anyone can make and READ a drawing on Wades Isometric paper.

for SKETCHES and WORKING DRAWINGS

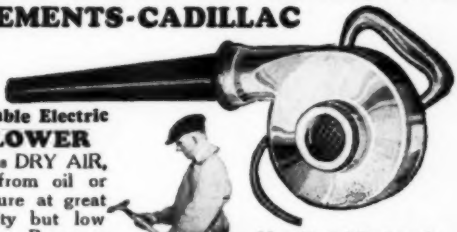
IN PADS WITH DIRECTIONS—	Buff Drawing	Tracing Parchment
Pocket Size, 4x6½ in.—100 sheets	$1.00	$1.00
Letter Size, 8½x11 in.— 50 sheets	1.00	1.00
Office Size, 11x17 in.— 25 sheets	1.00	1.00

Holes marked for standard loose-leaf books.

We also make—Perspective lined paper; Wade automatic irregular curves; Wade new style beam compass and Month-Graph and Year-Graph sheets. See your Office or Drawing Supply Dealer or write for illustrated folder.

WADE INSTRUMENT CO., 2274-H Brooklyn Station, Cleveland, Ohio

BLOW or SUCTION CLEAN with CLEMENTS-CADILLAC



Portable Electric

BLOWER

Drives DRY AIR, free from oil or moisture at great velocity but low pressure. Removes dust, lint, wood or metal particles — reducing risk of "shorts" and "burn-outs," cuts down fire hazard and excess wear. Convertible to sprayer or suction cleaner.

Most Useful Tool in Any Machine Shop, Factory or Power Plant. It KEEPS MACHINERY CLEAN.

TRY IT—FREE!

CLEMENTS MFG. CO.

6650 So. Narragansett, CHICAGO, ILL.

This machine is used for both immersion and vapor cleaning. In the usual sequence of operations the work is immersed in the boiling chamber, cooled in the clean solvent rinse, and finally suspended for a few seconds in the pure solvent vapors over the boiling chamber. The work is removed clean and dry. This complete cycle of cleaning operations is accomplished in less than a minute and yet every trace of oil and grease is removed.

Either "Perm-A-Clor" or "Triad" stabilized chlorinated solvent is used in Detrex Degreasers.

These solvents are non-inflammable and non-explosive and have a solubility factor for oils and greases more than four times that of ordinary organic solvents. The solvents are used over and over with but slight maintenance. The contamination resulting from the cleaning operation is removed from the solvent by periodic distillation within the machine. To facilitate this cleaning operation, there is an outlet from the solvent trough at one end.

The unit shown is especially arranged for electric heating, using three immersion type heaters. It is equipped with both top and bottom thermostats (expanded metal guard has been removed from top thermostat to show construction). The relay and switch equipment for this unit can either be placed on side of degreaser or mounted on a separate panel as shown.

These Detrex Degreasers are also designed for steam or gas heating.

A new folder distributed by Gits Brothers, 1846 Kilbourn Avenue, Chicago, Ill., illustrates an ingenious automatic multiple oiler recommended for high speed machinery. With these devices, oil may be forced from a central reservoir through 2 to 6 leads to various machine bearings at rates of 1 to 10 drops of oil per stroke. Persons interested in the economies of automatic oiling may obtain a copy free on request.

R & S THE ORIGINAL FRICTION DRIVE TAPPER . . .

1. Sizes from 3-16" to 5-8"
2. Motor or Belt Powered

Mr. Lead! Do you know?"—Taps never break in an R & S Tapper."

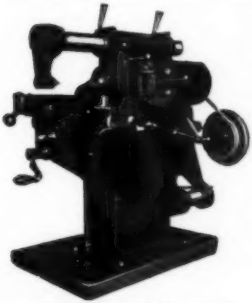
THE RICKERT-SHAFER CO.

Specialists in Thread Cutting Equipment

650 WEST 11th STREET, ERIE, PA.

3. Bench or Floor Styles
4. Horizontal or Vertical
5. Reverses 40% faster than it taps to protect tap from breaking. Push to tap, pull to reverse.
6. Thousands in world ser vice.

Oh Yes! Mr. Pitch That's an old melody --25 years old and still a big favorite.



No. 4 Motor Driven Milling Machine

BURKE

Milling Machine

This motor drive is available on our Nos. 1, 2, 3 and 4 Milling Machines.

Reversing switch has been conveniently located for the rapid handling of small work

Either ball or plain bearing spindles

Write for Circulars

The Burke Machine Tool Co., 297 E. 16th St., Conneaut, Ohio

NICHOLSON
2, 3 and 4 Way Valves
Flat Disc Type

Style E
For pressures up to 300 lbs.

Made in Lever, Foot, Solenoid, Motor and Diaphram operated types that are guaranteed to hold tight. Adapted for operating single and double-acting cylinders using air, steam, oil or water.

Bulletin on Request

Style H
For pressures up to 5000 lbs.

Other products—Nicholson Expanding Mandrels, Lever operated Arbor Presses, Steam Traps, Ball Floats, Flexible Couplings, Air Separators, etc.

W. H. Nicholson & Company
117 Oregon Street, Wilkes-Barre, Pa.

Why Waste Time On Broken Taps ?

Every minute spent by your high-priced mechanics in digging out broken taps is a dead loss. When a tap breaks it should be ***removed quickly with***

The Walton Tap Extractor

This handy tool has steel fingers which back out the tap ***without injuring the threads.*** It will save you many hours in the course of a year—paying for itself over and over again. Made in three and four-flute styles.

Try One in YOUR SHOP—
Sent on 60-day Trial Basis

The Walton Company
95 Allyn St., Hartford, Conn.

WRITE FOR COMPLETE NEW 1937 CATALOG

Wrigraph PRECISION DRAFTING MACHINE

Sizes Up To 20"x26"

WRIGRAPH—guaranteed accuracy, instrument workmanship. Brief case and drawing room models. Interchangeable drawing attachments to suit your drawing needs. Each unit is complete with a board and paper clamps. A compact machine for all drawing purposes.

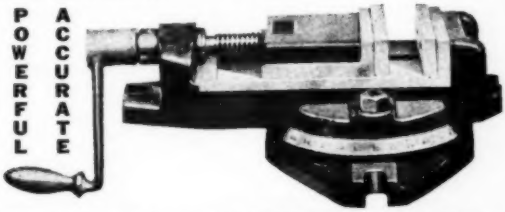
Junior machine complete as illustrated with 10x12" board; parallel device special triangle and paper clamps $5.

L·G·WRIGHT, INC.
5207 EUCLID AVE. CLEVELAND, OHIO.

UNIVERSAL-SWIVEL VISE

For Milling Machines, Shapers, Planers, Drill Presses. Jaws are Tool Steel Hardened and Ground. Circular Base Graduated in Degrees. Vise can be removed from Circular Base and used as Plain Vise if desired.

POWERFUL ACCURATE



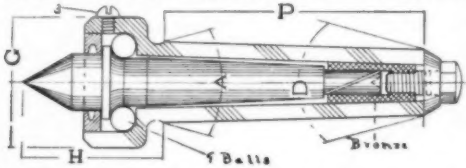
Width of Jaws—6"
Depth of Jaws—1½"
Jaw Opens— 4"

$25.00.

SEND FOR FOLDER

DURO TOOL CO., 20th & South St., PHILADELPHIA, PA.

RIGID RESILIENT LIVE CENTER



DESIGN

Note its Dearth of parts and Self-evident Functions. Springless, yet inherently Resilient. Races integral and immovable. Shortest Overhang, but long spindle and most Accurate. Smallest head, but largest Balls. Heaviest Duty, but lightest Runner.

Threadless housing, but thread-bound Assembly within. Construction obvious. Prices right. Terms, 30 days.

After 6 years, not one has ever yet broken down, or gone to junk.

Rigid Tool Holder Co., 12281 Turner Ave. Detroit, Michigan

Gem Drill Press Vises

No. 1 Vise

Price $18.00

Made of Malleable Iron.
Tool steel jaws with "V" grooves and accurately ground.

Length over all	12"	Depth of jaws	2"
Width	4½"	Jaws open	3½"
Height	4"	Weight	18 lbs.

We also manufacture larger vises

Circular on request

J. E. Martin Tool & Die Works

518 W. State St., Springfield, Ohio

You can reduce labor costs and step up production with

MALL PORTABLE GRINDERS

There is a size and type for practically every job. If you have a particular grinding or polishing problem, put its solution up to experienced MALL engineers. They will gladly advise you regarding the proper machine and attachment for YOUR job.

MALL TOOL COMPANY

7742 South Chicago Ave., Chicago, Illinois

Offices in all Principal Cities

GRANT

Riveters--Pioneers

in their line—Head rivets from smallest to ⅝" diameter either by NOISELESS SPINNING or VIBRATING HAMMER method—Sizes to meet all needs—Types include Vertical and Horizontal Multiple Spindles.

Write for literature—and don't forget to send samples.

The Grant Mfg. & Machine Co.

C. E. Station, Bridgeport, Conn.

There is a

MARSCHKE

Grinder and Buffer

For Every Purpose

Here for example is shown a large tool grinder with 5 H. P. motor and capacity for 16" to 20" diameter wheels as required in ***railroad shops*** and similar industry.

Send for catalog showing 15 other types of grinders and buffers.

Vonnegut Moulder Corporation
1805 Madison Avenue, Indianapolis, Ind.

Advanced Design

STEEL BODIES

Lighter, stronger, handier—crash-proof. 12 other design advancements. Size for size more power, more holes, more drill, still priced much lower. Sizes and types for every use. Make it a rule to see a SpeedWay before you buy.

Standard equipment in leading industrial plants.

WRITE FOR CATALOG

SpeedWay Manufacturing Co.
1822 So. 52nd Ave., Cicero, Ill.

SMALL GEARS

ALSO
MEDIUM SIZES IN ALL TYPES
AND MATERIALS

Massachusetts Gear & Tool Co.
36 Nashua St. Woburn Mass.

Install a "Gusher" Coolant Pump *and* Tank Unit

Save on Pumping Costs!

Elimination of piping and extra parts makes the "Gusher" simple to operate and easy to keep clean. This portable pump and tank combination is a complete unit, always ready for use.

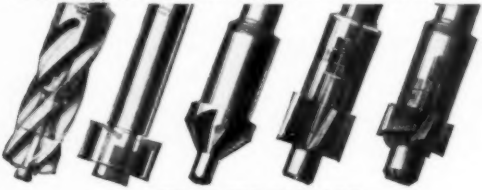
Centrifugal seal eliminates packing. Ball bearing motor mounted safely above the water line delivers a steady, high volume at low pressure. Heavy duty casters are optional equipment.

Gusher pumps need no priming and have no foot valves or gears. Chips and abrasives pass through them without injuring the mechanism.

Send for complete information

The Ruthman Machinery Co.
538 E. Front St., Cincinnati, Ohio

A complete line. Counterbores and Countersinks, Counterbore Sets, Spotfacers, Coredrills, Reamers, Hollow Mills, Full Floating Holders, Facing Heads, Form Cutters, Boring Bars, Boring Heads, Adjustable Extension Holders and Multi Diameter Tools.



WRITE FOR CATALOG

THE GAIRING TOOL CO.
1635 West Lafayette Blvd., Detroit, Michigan

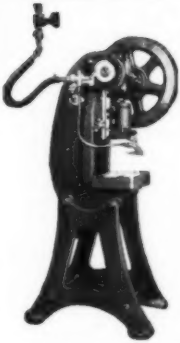
AIR VALVES

Do you wish to ***eliminate*** punch press danger?

Do you want to ***double*** your production?

Then install LITTELL'S new large-capacity Air Blast Valve and universal adjustment Air Nozzle.

They will quickly blow out pieces as heavy as 5 oz. with only 50 lbs. pressure.



—Write today for circular No. 9

Manufacturers of Punch Press Feeds and Reels

F. J. LITTELL MACHINE CO.
4125 Ravenswood Ave., Chicago

ARMSTRONG

TRADE MARK REG. IN U.S. PAT. OFFICE

TOOL HOLDERS

Cut Cutting - Costs

The **ARMSTRONG** System of Tool Holders provides permanent tools for every operation on lathes, planers, slotters and shapers—tools that reduce tooling-up to the selection of a bit and tightening of a screw. Each is a multi-purpose tool that with a few bits easily ground from stock shapes of high speed steel, does the work of a complete set of forged tools. Use **ARMSTRONG TOOL HOLDERS** on all machines to cut cutting-costs for they "Save All Forging, 70% Grinding and 90% High Speed Steel."

Write for Catalog B-27

Armstrong Bros. Tool Co.
"The Tool Holder People"
308 North Francisco Avenue,
CHICAGO, ILL.

Straight Shank Turning Tool

Boring Tool

Right-Hand Off-Set Side Tool

Threading Tool

DRILLING MACHINES

SIZES

Stationary Head—14"-20"-21"
Sliding Head — 24"-28"-32"-36"

These machines were formerly manufactured by the Rockford Machine Tool Company of Rockford, Illinois. Thousands of these machines have been installed and are giving universal satisfaction.

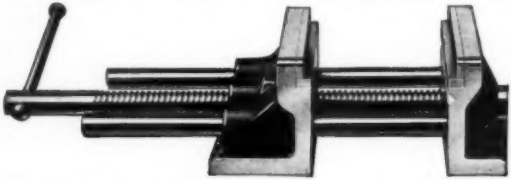
Also manufacturers of the Cleereman Automatically Oiled, Anti-Friction High Speed Drilling, Boring and Tapping Machines.

Builders of drilling equipment for over twenty years.

CLEEREMAN MACHINE TOOL COMPANY
Green Bay, Wisconsin

[Formerly Green Bay Barker Machine & Tool Works]

A Drill Press Vise
—with—
Built-In Parallels



No interference from chips or burrs; can be used from three sides. Save time and reduce costs on drilling operations. Two inches clearance for through drilling. ***Send for illustrated circular.***

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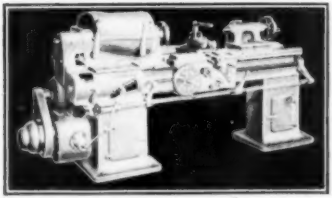
CHARD Twelve-Speed All Geared Lathes



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Instantaneous Start or Stop of Spindle.
12 Speed Changes in 15 seconds.
Heat Treated and Hardened Gears run in Oil in Speed Box.
All Shafts mounted on Ball Bearings.
Powerful, Accurate, and Easy Control.
Built in 16", 18" and 20" Standard Engine Lathes, Manfacturing Lathes and Tool Room Lathes.

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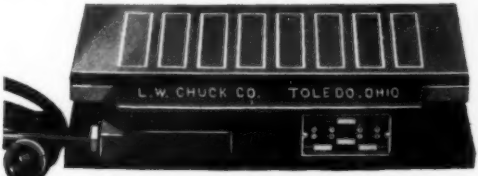

6½" wide, 18" long. Also made in 8"x24" & 10¼"x37" sizes.

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Waterproof for wet or dry grinding

A Magnetic Chuck that is adaptable for any purpose where a "real" Chuck is required. It is unconditionally guaranteed to furnish the highest magnetic holding power on either 110 or 220 volt direct current. Because this well designed and beautifully finished Chuck is made in one size only we are able to offer it at such a price. An **Outstanding Value** at.... **$60.00**

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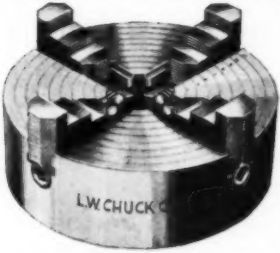

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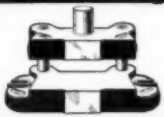

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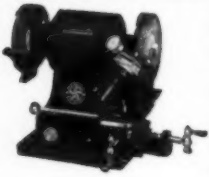

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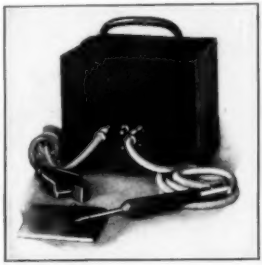

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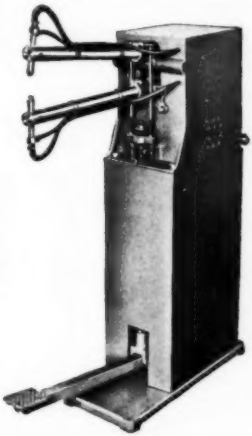

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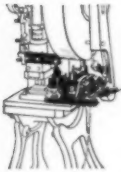

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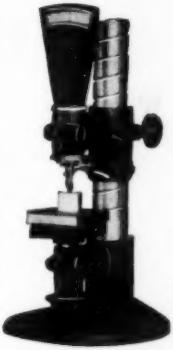

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***Mfrs.* of Ball Bearing Motors ¼ to 40 H. P.**

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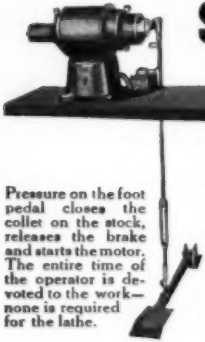

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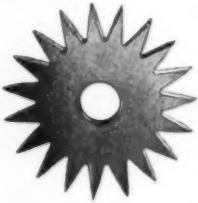

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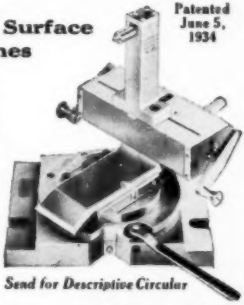

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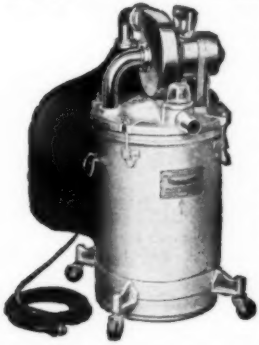

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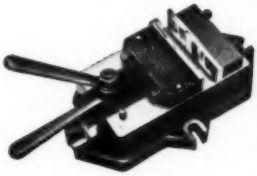

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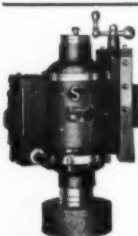

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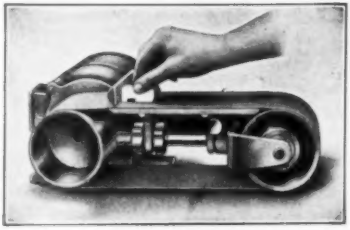

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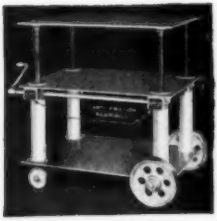

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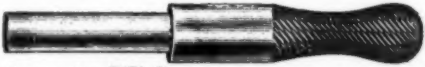

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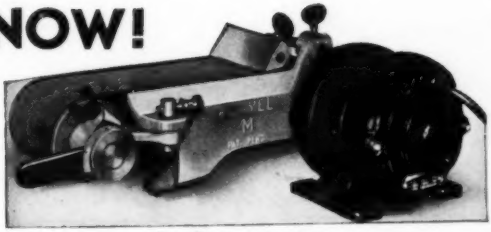

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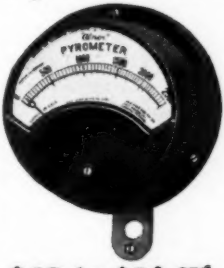

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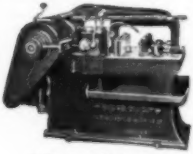

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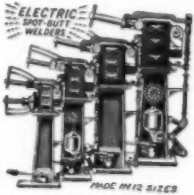

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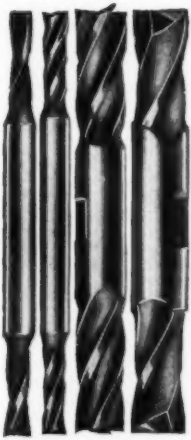

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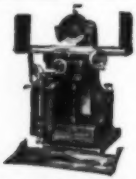

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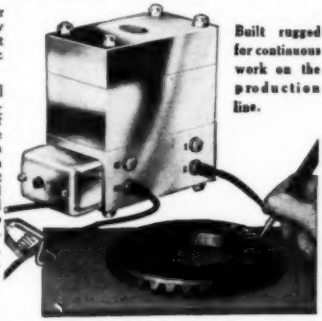

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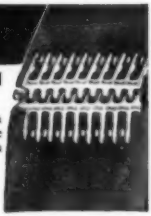

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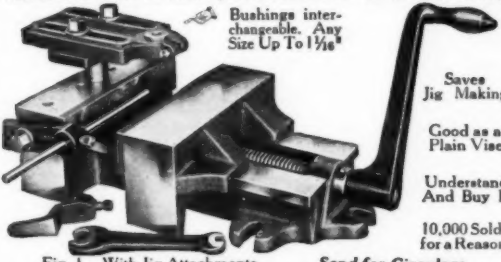

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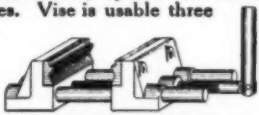

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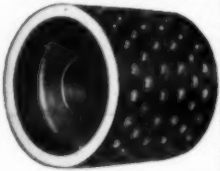

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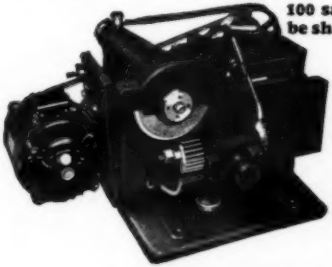

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Grinders, Swing Frame
Vonnegut Moulder Corp., Indianapolis, Ind.

Grinders, Tool Post
Standard Electrical Tool Co., Cincinnati, O.

Grinders and Polishers, Belt
Oliver Machinery Co., Grand Rapids, Mich.

Grinders, Vertical, Angle Plate
Standard Electrical Tool Co., Cincinnati, O.

Grinding Attachments, Drill
Carlson Mfg. Co., C. H., Minneapolis, Minn.
Oliver Instrument Co., Adrian, Mich.

Grinding Machines, Belt
Armgio Co., Milwaukee, Wis.
Production Machine Co., Greenfield, Mass.
Standard Electrical Tool Co., Cincinnati, O.
Walls Sales Corp., 96 Warren St., New York

Grinding Machines, Cutter, Reamer and Tool
Gallmeyer & Livingston Co., Grand Rapids, Mich.
National Machine Tool Co., Racine, Wis.
Oliver Instrument Co., Adrian, Mich.

Grinding Machines, External
Chicago Tool & Engr. Co., 8380 So. Chicago Ave., Chicago, Ill.
Standard Electrical Tool Co., Cincinnati, O.
Maxwell & Co., F. A., Bedford, Ohio

Grinding Machines, Floor
Standard Electrical Tool Co., Cincinnati, O.

Grinding Machines, Internal
Maxwell & Co., F. A., Bedford, Ohio
National Machine Tool Co., Racine, Wis.
Standard Electrical Tool Co., Cincinnati, O.

Grinding Machines, Portable Electric
Chicago Tool & Engr. Co., 8380 so. Chicago Ave., Chicago, Ill.
Chicago Wheel & Mfg. Co., M.C. Tool Div., 1101 W. Monroe St., Chicago, Ill.
R. G. Haskins Co., 4654 W. Fulton, Chicago
Mall Tool Co., 7742 S. Chicago Ave., Chicago
National Machine Tool Co., Racine, Wis.
Pratt & Whitney Co., Hartford, Conn.
Standard Electrical Tool Co., Cincinnati, O.
Strand Co., N. A., 5001 N. Lincoln St., Chicago
White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

Grinding Machines, Ring Wheel
Standard Elect. Tool Co., Cincinnati, Ohio

Grinding Machines, Surface
Gallmeyer & Livingston Co., Grand Rapids, Mich.
Standard Electrical Tool Co., Cincinnati, O.

Grinding Machines, Tap
Gallmeyer & Livingston Co., Grand Rapids, Mich.

Grinding Machines, Universal
Gallmeyer & Livingston Co., Grand Rapids, Mich.

Grinding Wheels
Chicago Wheel & Mfg. Co., M.C. Tool Div., 1101 W. Monroe St., Chicago, Ill.

Grinding Wheels, Mounted
Chicago Wheel & Mfg. Co., M.C. Tool Div., 1101 W. Monroe St., Chicago, Ill.

Grinding Wheels On Shanks
Chicago Wheel & Mfg. Co., M.C. Tool Div., 1101 W. Monroe St., Chicago, Ill.

Hack Saw Blades
Armstrong-Blum Mfg. Co., 341 N. Francisco Ave., Chicago

Hack Saw Machines
Armstrong-Blum Mfg. Co., 341 N. Francisco Av., Chicago

Hammers, Mallets and Malls
Chicago Rawhide Mfg. Co., 1200 Elston Av., Chicago, Ill.

Hand Saws, Portable Electric
Skilsaw, Inc., 3304 Elston Av., Chicago, Ill.

Hand Screw Machines, Precision Bench Type
Hardings Brothers, Inc., Elmira, N. Y.

Hangers, Ball, Roller and Babbitt
Chicago Die Casting Mfg. Co., 2502 W. Monroe St., Chicago

Heads, Boring
Flynn Manufacturing Co., Detroit, Mich.

Hole Cutters
Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago

Hollow Adjustable Mills
Gairing Tool Co., Detroit, Mich.
Kutmore Tool Co., Rochester, N. Y.

Index Centers
Wm. Carroll & Son, Norwood, Cincinnati, O.

Isometric Lined Paper
Wade Instrument Co., Cleveland, Ohio

Jigs and Fixtures
American Tool Works, Inc., Hartford, Conn.
Hamilton Tool Company, Hamilton, Ohio
Hartford Special Mchy Co., Hartford, Conn

Keyseating Machines
Burr & Son, John T., Brooklyn, N. Y.

Knurls and Holders, for Turrets
Graham Manufacturing Co., Providence, R.I.

Lathe Centers
Rigid Tool Holder Co., Detroit, Mich.

Lathe Drives
Cullman Wheel Co., 1959 Altgeld St., Chgo.
Hardings Brothers, Inc., Elmira, N. Y.

Lathes, Bench
Atlas Press Co., Kalamazoo, Mich.
Delta Mfg. Co., Milwaukee, Wis.
Hardings Brothers, Inc., Elmira, N. Y.
Rivett Lathe & Grinder Inc., Brighton, Boston
Sheldon Machine Co., 3255 Cottage Grove Ave., Chicago, Ill.
South Bend Lathe Works, South Bend, Ind.

Classified Finding Index

Lathes, Back Geared
Hivett Lathe & Grinder, Inc., Brighton, Boston
South Bend Lathe Works, South Bend, Ind.

Lathes, Brake Drum
South Bend Lathe Works, South Bend, Ind.

Lathes, Engine
South Bend Lathe Works, South Bend, Ind.

Lathes, Gap Head
South Bend Lathe Works, South Bend, Ind.

Lathes, Manufacturing
Sundstrand Machine Tool Co., Rockford, Ill.

Lathes, Precision Bench
Hardinge Brothers, Inc., Elmira, N. Y.

Lathes, Precision Bench Screw Cutting
Hardinge Brothers, Inc., Elmira, N. Y.

Lathe Service Parts
Millholland Sales Co., Indianapolis, Ind.

Lathes, Screw Cutting
South Bend Lathe Works, South Bend, Ind.

Lathes, Speed
Schauer Machine Co., Cincinnati, Ohio

Leader Pins, Steel
Acme Industrial Co., 419 N. Carpenter St., Chicago, Ill.

Leather Belting, All Types
Chicago Rawhide Mfg. Co., 1200 Elston Av., Chicago, Ill.

Leather Oil Retainers
Chicago Rawhide Mfg. Co., 1200 Elston Av. Chicago, Ill.
Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo.

Leather Pkg., Hydraulic & Pneumatic
Chicago Rawhide Mfg. Co., 1200 Elston Av., Chicago, Ill.

Lined Sketch Paper
Wade Instrument Co., Cleveland, Ohio

Lubricator, Automatic
Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo.
Norgren Co., C. A., Denver, Colo.

Mandrels, Saw and Grinding
Chicago Die Casting Mfg. Co., 2502 W. Monroe St., Chicago.

Mandrels, Expanding
W. H. Nicholson & Co., Wilkes-Barre, Pa.
Western Tool & Mfg. Co., Springfield, O.

Metal Spinning
Phillips Metal Spinning & Mfg. Co., Clev., O.

Micrometers
Swedish Gage Co. of Amer., Detroit, Mich.

Milling Attachments
Burke Machine Tool Co., Conneaut, Ohio
Wm. Carroll & Son, Norwood, Cincinnati, O.

Milling Machines, Bench
Burke Machine Tool Co., Conneaut, Ohio
Sundstrand Machine Tool Co., Rockford, Ill.
Hardinge Brothers, Inc., Elmira, N. Y.

Milling Machines, Precision Bench
Hardinge Brothers, Inc., Elmira, N. Y.

Milling Machines, Hand
Burke Machine Tool Co., Conneaut, Ohio
Sundstrand Machine Tool Co., Rockford, Ill.

Milling Machines, Plain
Burke Machine Tool Co., Conneaut, Ohio
Sundstrand Machine Tool Co., Rockford, Ill.

Motors
Chicago Electric Co., 1338 W. 22nd St., Chicago, Ill.

Motors, Small Universal
Speedway Mfg. Co., Cicero, Ill.

Motor-Generator Sets
Chicago Electric Co., 1338 W. 22nd St., Chicago, Ill.

Motor Drives, Universal
Cullman Wheel Co., 1359 Altgeld St., Chgo.

Motors, Electric Ball Bearing
Valley Electric Corp., St. Louis, Mo.

Moulds & Ladles, Hammer and Vise.
Johnston Tool Co., East Providence, R. I.

Multiple Oilers
Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo

Nibbling Machines
National Machine Tool Co., Racine, Wis.

Oil Cups
Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo.

Oil Gauges
Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo.

Oil and Grease Seals
Gits Bros. Mfg. Co., 1860 S. Kilbourn, Chgo.

Packing, Hydraulic
Chicago Rawhide Mfg. Co., 1200 Elston Av., Chicago, Ill.

Perspective Lined Paper
Wade Instrument Co., Cleveland, Ohio

Pillow Blocks
Chicago Die Casting Mfg. Co., 2502 W. Monroe St., Chicago

Pins and Lacing for Belting
Chicago Rawhide Mfg. Co., 1200 Elston Av., Chicago, Ill.

Pins, Leader And Dowel
Acme Industrial Co., 419 N. Carpenter St., Chicago, Ill.
Baumbach Mfg. Co., E. A., 1812 So. Kilbourne Ave., Chicago

Pipe Cutters
Ridge Tool Co., Elyria, Ohio

Pipe Vises
Ridge Tool Co., Elyria, Ohio

Pipe Wrenches
Ridge Tool Co., Elyria, Ohio

Plug Gauges
United Precision Products Co., 4618 W. Huron St., Chicago, Ill.

Point Thinning Machines
Oliver Instrument Co., Adrian, Mich.

Press Brakes
Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.

Classified Finding Index

Presses, Arbor
Atlas Press Co., Kalamazoo, Mich.
W. H. Nicholson & Co., Wilkes-Barre, Pa.
Sheldon Machine Co., 3255 Cottage Grove Ave., Chicago, Ill.
Wilson, K. R., Buffalo, N. Y.

Presses, High Speed
Super Speed Press Corp., Riverside, N. J.

Presses, Power
Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.

Presses, Punch
Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.
Lewthwaite Mche.Co.,T.H., 311E.47th.,N.Y.
Super Speed Press Corp., Riverside, N. J.

Pullers, Gear and Wheel
Armstrong-Bray & Co., 315 N. Sheldon St., Chicago, Ill.

Pulleys, Die Cast
Chicago Die Casting Mfg Co., 2502 W. Monroe St., Chicago.

Pulleys, Steel and Wood
Delt. Mfg. Co., Milwaukee, Wis.

Pulleys, Vacuum Cup
Vacuum Cup Metal Pulley Co., Detroit

Pumps
Fulflo Specialties Co., Blanchester, Ohio

Pumps, Lubricant
Ruthman Machinery Co., Cincinnati, Ohio

Punch Press Feeds
Littell Machine Co., F. J., 4125 Ravenswood Ave., Chicago, Ill.
Wittek Mfg. Co., 4809 W. 24th Place, Chgo.

Punch, Shear and Bender, Hand
Armstrong-Blum Mfg. Co., 341 N. Francisco Ave., Chicago

Punches, Hand
Armstrong-Blum Mfg. Co., 341 N. Francisco Ave., Chicago
Buffalo Forge Company, Buffalo, N. Y.
Lewthwaite Mche. Co., T. H., 311 E. 47th, New York
Whitney Metal Tool Co., Rockford, Ill.

Punches and Dies
Lewthwaite Mche.Co.,T.H.,311E.47th.,N.Y.

Pusher Tubes
Modern Collet & Machine Co., Ecorse, Mich.

Pyrometers
Illinois Testing Laboratories, Inc., 150 W. Austin Ave., Chicago
Pyrometer InstrumentCo., 102-105 Lafayette St., New York City

Pyrometers, Optical
Pyrometer InstrumentCo., 102-105 Lafayette St., New York City

Pyrometers, Portable & Stationary
Illinois Testing Laboratories, Inc., 150 W. Austin Ave., Chicago, Ill.

Pyrometers, Surface
Pyrometer InstrumentCo., 102-105 Lafayette St., New York City

Racks, Cut
Massachusetts Gear & Tool Co., Woburn, Mass.

Reamer Holders
W. H. Nicholson & Co., Wilkes-Barre, Pa.

Regrinding, Tool
Renu Tool Co., Detroit, Mich.

Riveters, Multiple Spindle
Grant Mfg. & Mche. Co., Bridgeport, Conn.

Riveters, Pneumatic
Grant Mfg. & Mche. Co., Bridgeport, Conn.

Riveting Machines
Grant Mfg. & Mche. Co., Bridgeport, Conn.
Linley Bros Co., Bridgeport, Conn.

Rod Cutters
Armstrong-Blum Mfg. Co., 341 N. Francisco Av., Chicago
Lewthwaite Mche.Co.,T.H.,311 E.47th.N.Y.

Router Bits
Putnam Tool Co., Detroit, Mich.
Weldon Tool Co., Cleveland, Ohio

Salvage
Vinco Tool Co., Detroit, Mich.

Sanders
Rotor Air Tool Co., Cleveland, Ohio

Saws, Electric Hand
Delta Mfg. Co., Milwaukee, Wis.

Saw Sharpening Machines
Wardwell Manufacturing Co., Cleveland,O.

Sawing Machines
Continental Mche. Specialties, Minneapolis

Screw Drivers, Electric
Haskins Co., R. G., 4654 W. Fulton, Chgo.

Screw Machine Parts
Modern Collet & Machine Co., Ecorse, Mich.

Shafts, Flexible
R. G. Haskins Co., 4654 W. Fulton, Chicago
Pratt & Whitney Co., Hartford, Conn.
Strand Co., N. A., 5601 N. Lincoln St., Chgo.
White Dental Mfg. Co., 10 E. 40th Street New York, N. Y.

Shafts, Hangers & Boxes
Delta Mfg. Co., Milwaukee, Wis.

Shapers
Western Mche. Tool Wks., Holland, Mich.

Shaping Machines
Osborne & Sexton Machy. Co., Columbus, O.
Western Mche. Tool Wks., Holland, Mich.

Shears, Hand
Armstrong-Blum Mfg. Co. 341 N. Francisco Av., Chicago
Beverly Throatless Shear Co., 3007 W. 110th Place, Chicago, Ill.
Lewthwaite Machine Co., T. H., 311 E. 47th St., New York
The National Machine Tool Co., Racine, Wis.
Whitney Metal Tool Co., Rockford, Ill.

Shears, Power
Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.

Shears, Slitting
Beverly Throatless Shear Co., 3007 W. 110th Place, Chicago, Ill.
Dreis & Krump Mfg. Co., 7440 Loomis Blvd., Chicago, Ill.
National Machine Tool Co., Racine, Wis.

Shears, Throatless
Beverly Throatless Shear Co., 3007 W. 110th Place, Chicago, Ill.

Shop Lights
Chicago Die Casting Mfg. Co., 2502 W. Monroe St., Chicago,

Speed Saws, Universal
Wyzenbeek & Staff, Inc., 642 Washington Blvd., Chicago

Classified Finding Index

Special Tools and Machinery
American Tool Works, Inc., Hartford, Conn.

Speed Reducers
Abart Gear & Mchc. Co., 4832 W. 16th St., Cicero, Ill.
Armgio Co., Milwaukee, Wis.
Chicago Gear Wks., 769 W. Jackson, Chgo.
Cullman Wheel Co., 1859 Altgeld St., Chgo.
Multiple Boring Machine Co., St. Louis, Mo.

Spinning Lathes, Metal
Oliver Machinery Co., Grand Rapids, Mich.

Spools & Nuts for Auto. Screw Mchs.
Sutton Tool Co., Detroit, Mich.

Spot Welding Machines, Speed.
Armgio Co., Milwaukee, Wis.
Elster Engineering Co., Inc., Newark, N. J.
Pier Equipt. Mfg. Co., Benton Harbor, Mich.

Sprockets
Cullman Wheel Co., 1859 Altgeld St., Chgo.
Massachusetts Gear & Tool Co., Woburn, Mass.

Stampings
Gerding Brothers, Cincinnati, Ohio

Straightening Machines
Whitney Metal Tool Co., Rockford, Ill.

Tables, Elevating
Midwest Tool & Engineering Co., Dayton, O.

Tap Extractors
Walton Co., Hartford, Conn.

Tap Holders
Procunier Safety Chuck Co., 14 S. Clinton St., Chicago

Tapping Machines
Ettco Tool Co., Brooklyn, N. Y.
Rickert-Shafer Co., Erie, Pa.
Western Mchs. Tool Wks., Holland, Mich.

Tapping Attachments
Errington Mech. Lab., Staten Island, N. Y.
Ettco Tool Co., Brooklyn, N. Y.
Procunier Safety Chuck Co., 14 S. Clinton St., Chicago, Ill.
Western Mchs. Tool Wks., Holland, Mich.

Tapping Jigs, Universal
Heuser Mfg. Co., 1536 No. Paulina St., Chicago, Ill.

Tapping Machines and Attachments
Berks Machine Tool Co., Conneaut, Ohio
Cleereman Mchs. Tool Co., Green Bay, Wis.
Ettco Tool Co., 594 Johnson Av., Brooklyn, N. Y.
Haskins Inc., R. G., 4654 W. Fulton St., Chicago, Ill.
Procunier Safety Chuck Co., 14 So. Clinton St., Chicago, Ill.
Whitney Metal Tool Co., Rockford, Ill.

Thermometers, Resistance Type
Illinois Testing Laboratories, Inc., 150 West Austin Ave., Chicago, Ill.

Threading Machines, Automatic
Grant Mfg. & Mchs. Co. Bridgeport, Conn.
Rickert-Shafer Co., Erie, Pa.

Threading Tools
Armstrong Bros. Tool Co., 906 N. Francisco Av., Chicago
Ridge Tool Co., Elyria, Ohio.
Rivett Lathe & Grinderine, Brighton, Boston

Tool Holders
Armstrong Bros. Tool Co., 906 N. Francisco Av., Chicago
Rigid Toolholder Co., Detroit, Mich.
Western Tool & Mfg. Co., Springfield, O.

Tools
Vinco Tool Co., Detroit, Mich.

Tools, Abrasive
White Dental Mfg. Co., 10 E. 40th Street, New York, N. Y.

Tools, Boring
Armstrong Bros. Tool Co., 906 N. Francisco Av., Chicago
Gairing Tool Co., Detroit, Mich.

Tool Grinding
Renu Tool Co., Detroit, Mich.

Tool Salvage
Renu Tool Co., Detroit, Mich.

Tools, Lathe and Planer
Armstrong Bros. Tool Co., 906 N. Francisco Av., Chicago

Tools, Machinists'
Armstrong Bros. Tool Co., 906 N. Francisco Av., Chicago

Tools, Multi-Diameter
Gairing Tool Co., Detroit, Mich.

Tracing Sheets
Wade Instrument Co., Cleveland, Ohio

Tube Flanging Machines
Grant Mfg. & Mchs. Co., Bridgeport, Conn.

Turning Tools
R & L Tools, Nicetown, Phila., Pa.

Turret Lathes
Millholland Sales Co., Indianapolis, Ind.

Turret Lathes Tools
Millholland Sales Co., Indianapolis, Ind.

Universal Drill Jigs
Heuser Mfg. Co., 1536 No. Paulina St., Chicago, Ill.

Universal Joints
American Tool Works, Inc., Hartford, Conn.
Chicago Gear Works, 769 W. Jackson Blvd., Chicago

Used and Rebuilt Machinery
Aaron Machinery Co., 176 Lafayette St., New York, N. Y.
Adams Mchr. Co., 134 S. Clinton St., Chgo.
Alamo Engine Co., Hollsdale, Mich.
American Machinery Co., Cleveland, Ohio
Beal & Co., Jos., Boston, Mass.
Beatty Machine Mfg. Co., Hammond, Ind.
Sahlen Machinery Co., Cincinnati, Ohio
Belyea Co., Inc., 150 W. 18th St., New York, N. Y.
Bennet-RafkinCorp., 30 ChurchSt., N. Y. N. Y.
Bernstein & Co., Geo. M., 128 Clinton, Chgo.
Bleser Mfg. & Mchr. Co., Springfield Ill.
Bradley Machinery Co., Detroit, Mich.
Brown Machinery Co., St. Louis, Mo.
Brownell Machinery Co., Providence, R. I.
Clinton Mchr. Co., 33 S. Clinton St., Chgo.
Columbia Machinery Co., Fort Wayne, Ind.
Davis Machinery Co., Toledo, Ohio.
Denny, W. I., 616 W. Lake St., Chicago.
Eastern Machinery Co., Cincinnati, O.
Elster Engineering Co., Newark, N. Y.
Emerman, Louis E. & Co., 1761 Elston Ave., Chicago, Ill.
Erie Electric Motor Repair, Inc., Buffalo, N. Y.

Classified Finding Index

Used and Rebuilt Machinery—Cont.

Easley Machinery Co., E. L., 825 Rees St., Chicago, Ill.
Falk Mill Supply Co., Rochester, N. Y.
Ford City Machinery Sales Co., Ford City, Pa.
General Blower Co., 401 N. Peoria St., Chgo.
General Machinery Corp., Boston, Mass.
Goldman, Harvey H., Detroit, Mich.
Goldsher Machinery Co., 817 W. Lake St., Chicago.
Hill, Clarke & Co., 645 W. Washington Blvd., Chicago, Ill.
Howarth Mchy. Co., Inc., C. C., Detroit, Mich.
Hyman & Sons, Joseph, Philadelphia, Pa.
Indianapolis Machinery & Supply Company, Indianapolis, Ind.
International Machinery Co., Detroit
Interstate Mchy Co., 130 S. Clinton, Chgo.
Iroquois Machinery Co., Buffalo, N. Y.
Johnson & Sons Machinery Co., Wm. C., St. Louis, Mo.
Jones Machine Tool Co., Cincinnati, Ohio
Kinsey Co., E. A., Cincinnati, Ohio
Klauber Machinery Co., E. L., St. Louis, Mo.
Lucas, J. L., Bridgeport, Conn.
McDonald Machinery Co., St. Louis
McCabe & Sheeran Machinery Corp., 50 Church St., New York, N. Y.
McMullen C. K. Co., Grand Rapids, Mich.
Machinery Dealers, Inc., New Haven, Conn.
Marr-Galbreath Mchy. Co., Pittsburgh, Pa.
Marsh Machinery Co., A. R., Cleveland, O.
Midwest Equipment Co., 628 W. Lake St., Chicago, Ill.
Miles Machinery Co., Saginaw, W. S., Mich.
Molitor Machinery Co., Charles L., 120 S. Clinton St., Chicago, Ill.
Morey & Co., 45 Mill St., Astoria, Long Island, N. Y.
Morris Machinery Co., Newark, N. J.
Norton-Broadway Machinery Co., Cincinnati, Ohio
O'Brien Machinery Co., Philadelphia
Ott Machinery Sales Co., Detroit, Mich.
Osborne & Sexton Machy. Co., Columbus, O.
Reliance Machinery Sales Co., Pittsburgh, Pa.
Reynolds Machinery, Providence, R. I.
Riverside Machinery Depot, Detroit, Mich.
Rosenkranz & Weisbecker, 2309 A. Singer Bldg., New York City
Russell Machine Co., Pittsburgh, Pa.
Scott-Sandbach Mchy. Co., 4607 W. 20th St., Chicago
Scully Jones & Co., 1901 S. Rockwell St., Chicago, Ill.
Segal Machinery Co., 117 S. Clinton St., Chicago, Ill.
Simmons Machine Tool Corp., Albany, N. Y.
Standard Mchy. Co., Grand Rapids, Mich.
Stockman, John A., Homestead, Pa.
Strong, Carlisle & Hammond Co., Cleveland.
Sun Machinery Co., 29 Van Buren Street, Newark, N. J.
United Mchry. & Supply Co., St. Louis, Mo.
Victor Machinery Co., 128 S. Clinton Street, Chicago, Ill.
Victor Machinery Exchange 231 Centre St., New York, N. Y.
Vine, R. A., Detroit, Mich.
Wain Mchy. Sales, Chas. E., Detroit, Mich.
Waters Machinery Co., Elkhart, Ind.
Weiner Mch. Co., 257 Centre St., N. Y. N. Y.
Wertman Machinery Co., Cleveland, Ohio
West Penn Machinery Co., Pittsburgh, Pa.
White Machr. Co., A. D., 108 N. Jefferson St., Chicago
Wigglesworth Mchy. Co., Cambridge, Mass.
Wolnick Machinery Sales, 9 S. Clinton St., Chicago, Ill.

Vacuum Cleaners, Portable

Breuer Elec. Co., 846 Blackhawk St., Chgo.

Vacuum Cleaners, Industrial

Breuer Elect. Co., 846 Blackhawk St., Chgo.

Valves, Foot, Lever & Solenoid

Nicholson & Co., W. H., Wilkes-Barre, Pa.

Vises, Drilling Machine

Armstrong-Blum Mfg. Co., 841 N. Francisco Av., Chicago
Armstrong Bros. Tool Co., 303 N. Francisco Av., Chicago
Graham Manufacturing Co., Providence, R. I.
Heuser Mfg. Co., 1638 No. Paulina St., Chicago, Ill.
L-W Chuck Co., Toledo, Ohio
Martin Tool & Die Works, J. E., Springfield, O.
National Machine Tool Co., Racine, Wis.
Odin Universal Corp., 110 S. Dearborn, Chgo.
Sheldon Machine Co., 3255 Cottage Grove Ave., Chicago, Ill.

Vises, Drill

Johnson Tool Co., East Providence, R. I.

Vises, Machinists'

Chicago Tool & Engr. Co., 3880 So. Chicago Ave., Chicago, Ill.
L-W Chuck Co., Toledo, Ohio
Odin Universal Corp., 110 S. Dearborn, Chgo.
Sheldon Machine Co., 3255 Cottage Grove Ave., Chicago, Ill.
Western Tool & Mfg. Co., Springfield, O.

Vises, Milling Machine

Graham Manufacturing Co., Providence, R. I.
Hartford Special Mchy. Co., Hartford, Conn.
L-W Chuck Co., Toledo, Ohio
Odin Universal Corp., 110 S. Dearborn, Chgo.
Sheldon Machine Co., 3255 Cottage Grove Ave., Chicago, Ill.

Vises, Precision

Odin Universal Corp., 110 S. Dearborn, Chgo.

Vises, Shaper

Graham Manufacturing Co., Providence, R. I.
L-W Chuck Co., Toledo, Ohio
Odin Universal Corp., 110 S. Dearborn, Chgo.

Welding Machines, Electric Spot

Armgie Co., Milwaukee, Wis.
Eisler Engineering Co., Inc., Newark, N. J.
Pier Equipment Co., Benton Harbor, Mich.

Welding Machines, Resistance

Armgie Co., Milwaukee, Wis
Eisler Engineering Co., Inc., Newark, N. J.
Pier Equipt. Mfg. Co., Benton Harbor, Mich.

Wheel Pullers

Armstrong-Bray & Co., 315 N. Sheldon St., Chicago, Ill.

Wheels, Grinding

Chicago Wheel & Mfg. Co., M. C. Tool Div., 1101 W. Monroe St., Chicago, Ill.

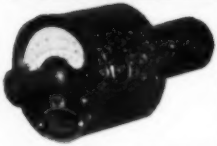
Woodworking Machinery

Tannewitz Works, Grand Rapids, Mich.

Worm Gear Motor Units

Star Mchs. & Eng. Co., Bloomfield, N. J.

PYRO RADIATION PYROMETER



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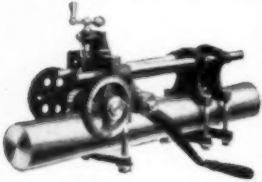

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Air comp., 4½x4½ Curtiss	$ 25.	Motor, 3 h. p. 3 ph	$ 25.
Band saw 22"	18.	Miller, No. 6 Transit	300.
Knife grinder, 79"	125.	Punch, Cleveland, ½"x½"	195.
Lathe, 36"x18' L. & Ship. m. d.	1500.	Radial drill, 7'	325.
Lathe, 14"x8' Carrol J. q. c.	295.	Shear, punch, Badger E-1	275.

FOR SALE BY

H. F. Wolnick Machinery Co., - - 9 So. Clinton St., Chicago, Ill.

Boring mill, 84", vertical.
Boring mill, Betts horiz., 2½" bar.
Drill, No. 1 Morse taper, 4-spindle.
Gear hobber, No. 12 Barber-C.
Grinder, Diamond, lrge, 30" wh., m.d.
Grinder, No. 1 Cinc. tool & cutter.
Lathe, bench, Dalton, legs and pan.
Presses, Nos. 1 to 5 o. b. i.
Saw sharpener, auto., Cochrane-Bly.
Shear, circular, Lenox, 14 ga. cap.

FOR SALE BY

Standard Machinery, 321 Lake Michigan Dr., Grand Rapids, Mich.

Automatic, ⅜" Gridley Model G.
Automatic, 1¼" Gridley Model F.
Automatic No. 00 B. & S.
Drill, Allen 2 spindle b. b.
Drill, Baker 3" heavy duty.
Drill, Natco Model 5D multiple.
Lathe, No. 2 B. & O. turret (1").
Press, D-23 Ferracute inclinable.
Press, No. 18 Bliss inclinable.
Welder, No. 259A12T. Gibb. 60-440 v.

FOR SALE BY

Box 148, c/o Hitchcock Pub. Co., 508 S. Dearborn St., Chicago, Ill.

GEAR MACHINERY.

1—Brown & Sharpe Co. spur gear cutter, serial No. 28, with standard equipment and countershaft.
1—Lees-Bradner Co. No. 5A gear generator and hobbing machine, with standard equipment and countershaft.

FOR SALE BY

International Machinery Co., 3178 Bellevue Ave., Detroit, Mich.

DRILLS

No. 11, 13, 14, and 30 Natco multiple.
1 and 2-spindle, Leland & Gifford.
3 spindle, No. 2B Ediund, power drive to each spindle.
2 spindle, Fosdick, 12" overhang, p.f.
21" and 24" Cincinnati sliding head.
216 and 217 Bakers.
5' American 15" column, mtr.-on-arm.

GRINDERS

70 Heald internal.
Nos. 10 & 11 Brown & S. pl., s.p.d.
No. 2 Diamond surface, m. d.
84" Diamond surface, m. d.

MILLING MACHINES

No. 3 Cincinnati universal complete.
24" Cincinnati duplex, m. d.
18" Cincinnati automatic.
Ingersoll open side vertical 8', length of table, m. d.
Garvin cam and form, 36" capacity.

PUNCH PRESSES AND SHEARS

No. 73½ Bliss punch press, 3" stroke.
No. 7 Cleveland o. b. i. press, 3" str.
3A Bliss horning press, 1" stroke.
36 Niagara m. d., flywheel in back.
No. 73½ Bliss, single crank, 18" str.
10' x3/16 capacity Streine squaring shear, 18" gap, m. d.
No. 196 Niagara squaring, 18 gauge capacity.

LATHES

14"x6' Prentiss g. hd. motor in base.
22"x8' Monarch geared head, m. d.
24"x14' Prentiss geared head, m. d.
18"x8' Amer. grd. hd., m. d. & t. a.

MISCELLANEOUS

16" G. & E. shapers, motor dr., (3).
32" G. & E. shapers, motor drive.

FOR SALE BY

Wm. C. Johnson & Sons Machinery Co.,

1211-1223 Hadley Street, St. Louis, Mo.

Air compressors, 30' to 2000'.
Bolt threader Little Giant 1½".
Bolt threader, Nat. 3".
Bolt threader, 2 heads, Nat. 1".
Boring mill, 5'-8' Betts extension.
Boring mill, 42" Colburn, (2).
Boring mill, No. 0 Barret.
Boring mill, 36" Gisholt tur. head.
Boring mill, hor. 2½" bar Lucas, universal with A. C. motor
Boring mill,, hor. 4½ bar Betts knee type.
Bulldozers, No. 3-4 and 8.
Drill, radial 3' American.
Drill, radial 3' Gang.
Drills, radial, 4' arm, Dreses, b. d.
Drills, radial, 5' arm, Dreses, spd.
Drills, Colburn D4.
Drills, Baker 24".
Furnaces, various sizes.
Gear cutter, 60" G E. spur.
Grinder, 12" x72" Landis, m. d.
Grinders, 10x36 Thompson uni.
Grinders, 13x66 Landis universal.
Grinders, 16x66 Landis cyl. plain.
Grinders, surface Springfield 24x60".
Hammers, 500 & 25 lb. Little Giant.
Hammer, 200 lb. Bradley.
Hammer, steam 4000 to 250 lb.
Keyseater, No. 2 M&M.
Lathes, 14"x6 American gear head.
Lathes, 14"x6 Hendey.
Lathes, 18"x12 Mueller, q.c.g.
Lathes, 20"x8 Walcott, q. c. g.
Lathes, 26"x12 Flather, q. c. g.
Lathes, 30"x24 Bradford.
Lathes, turret, No. 0 Foster.
Lathes, turret, 24" Steinle.
Lathes, 3 Gridley 2½", Model F., 4 sp.
Miller, No. 4 Brown & S., plain.
Miller, No. 3 Hendey, plain.
Miller, No. 1½ Rockford.
Millers, No. 4 Cincinatti pl., c. d.
Millers, No. 1 U. S. hand.
Millers, Ingersoll, 27"x24"x10'.
Planer, 36x30x8 Cleveland open side.
Planers, 60"x48"x10' Gray, 2 heads.
Planers, 24"x24"x6' Gray, 1 head.
Planers, 36"x30"x8' Cincinatti, 2 hds.
Planers, 36"x36"x10' Gray, h.d. 2hds.
Planers, 36"x36"x10' Cincinnati.
Press, 91C Toledo.
Press, whl., 250 ton 54" Tomlin-Harris
Press, No. 2-3 & 4 Marshalltown, o. b. i., new.
Press, arch, d. c., 28x54 bolster, No. 37 ex.
Rolls, Niagara, 66" slip end, 5/16" cap.
Saw, No. 14 Higley.
Saw, No. 2 Marvel.
Saws, 6x6 Robertson (2).
Shaper, 16" Smith & Mills.
Shear, 10' Niagara, 18 ga.
Shear, 3' Niagara, 16 ga.
Shears, 310 Niagara ring & circle 1/4"
Shears, 44" Bertsch sq., 16 ga.
Shears, No. 114 Lenox 1/4".
1000 other tools available.

USED AND REBUILT MACHINERY

FOR SALE BY

Marr-Galbreath Machinery Co., 55 Water St., Pittsburgh, Pa.

Quality Not Reflected in These Low Prices.

Air compressor outfits for garages, ½, 1 & 1½ h. p. 1/60/110-220.
Air compressor, 4x4" Union air cooled.
Bender & straightener, No. 4 H. & J.
Blower, 4E Buffalo 1/60/220.
Bolt cutter, 3" Acme dies, b. b.
Bolt threader, 2½" Landis dbl., m. d.
Boring mill, 30" Colburn, turret hd.
Boring mill, 30" Bullard V T L, threading attachment.
Boring mill, floor, 6" bar N. B. P., 230 v. d. c., 2 column.
Brakes, hand, 4'x14 ga. Robinson
Brakes, hand, 6'x16 ga. Keene.
Brake lining, punch and riveting machine, m. d.
Bulldozer, No. 6 W-W., clutch, b.d.
Bulldozer, No. 22, W.-W., m. d.
Chain hoists, 1½, 2, 3 and 4-ton.
Crusher, Allis-Chalmers, 9x9", 2-roll, belt drive.
Die sinker, No. 3 P. & W., r. t.
Drill, 28" Superior, b. g., power fd.
Drill, 5, 6 spdl. L.-G., b. b., m. d.
Drill, rad., 2½' Fosdick & Holloway.
Drill, radial, 3½' Canedy-Otto.
Drill, radial, 4' Dreses Simplex.
Furnace, American Gas, 6"x3'x9½" opening.
Grinder, 6x32" Norton, pl., (rebuilt)
Grinder, Nos. 1, 1½ & 2, tool & cut.
Grinder, 7½ h. p., U.S. dbl. end, 3/60.
Grinder, pl. 11 B. & S. 4x30" (cheap).
Hammer, 40 lb. Bradley horiz. helve, m. d.
Hammer, power, 80 lb. Boss, b. d.
Hammer, power, 50 lb. Little Giant, belt drive.
Hammer, 200 lb. Beaudry, power.
Hammer, 800 lb. Erie SF steam or air.
Hammer, Syntron Elec., 1/60/110/.
Hammer, 400 lb. Bliss board drop, b.d.
Header, cold, ⅝" W.-F. D. S.-OD.
Hoist, chain, 4-ton triplex. Y. & T.
Jointer, bench, 4" Wallace.
Keyseater, No. 3 Mitts & M., b. d.
Keyseater, No. 2 Catlin, cap. 2"x15".
Lathes, 14"x6' Hamilton & Rockford quick change geared.
Lathes, 16"x7' National, q.c. g., (3).
Lathe, 36"x16' L. & S. g. h., m. d.
Lathe, Fox Monitor, 18"x6' Springfi.
Lathe, 26"x16' Bridgeford, q.c.g.g.h.
Lathe, turret, No. 2 B. & O., b. d.
Lathe, turret, No. 4 W. & S., bar feed, m. d. (2).
Lathe, 11" Sundstrand, g. h., s. p. d.
Lathe, 14"x19' Fay automatic.
Miller, hand, No. 1 U. S. (2).
Miller, No. 4 Ohio table 101".
Pipe machine, 12" Cox., b. d.
Pipe machine, 8" Stoever, gear box, s. p. d.
Pipe machine, 4" B. & K., gear box, motor drive.
Pipe machine, 12" E. C. & B., with cut-off.
Planer, Gray, 56x48x10', 4 heads.
Planer, 30"x30"x8' Liberty, 2-h. m. d.
Planer, 48"x48"x10' Gray, 3-hds., b. d.
Press, punch, No. 35 Niagara, plain, belt drive.
Press, No. 2 Con., o. b. i., 2" str., m. d.
Press, D. C. 138-C Stoll, t. r., b. g.
Press, S. C. 57, 57½ & 58 Toledo, b. g.
Press, S. C. 70½ Bliss, t. r., d. b. g., 16" stroke.
Press, Arbor, No. 8 Greenerd, hand
Press, horn., No. 2 Swaine, 2" str.
Press, 30-ton Lourie hydraulic.
Press, trimming 58½ Toledo d. b. g., 10" stroke, friction clutch, m. d.
Press, No. 83 Bliss redu., bg., 10" str
Press, hydraulic 200 ton oil gear pump m. d., rapid ac., 10" st., bed 24x16".
Punch & s., s. e., 24" tht. Cleve. "C".
Punch & shear, 25x24 U. Buffer univ., m. d.
Rolls, No. 3 Oliver, hand or power universal.
Rolls, 42"x3" Pexto, latch hsgs., hand.
Sandblasts, Pangborn AU-3 & AA-1.
Sandblast, Leiman, size A-1.
Saw, No. 1 Marvel hack, 4"x4", b.d.
Saw, 6"x6" Racine hack, gear box, belt drive.
Saw, No. 66 Cochrane-Bly, cap. 10" rds., 9" sq.
Screw machine, No. 2 P. & W. plain.
Shaper, 20" G. & E. b. g., m. d.
Shaper, 21" Smith & Mills.
Shaper, 24" Barker b. g. V-ram, b. d.
Shaper, 24" Gould & Eberhardt, b. g., high duty, b. d.
Shear, No. 16-A Niagara ring and circle, 14 ga.
Shear, throatless 18-M Marshalltown, motor drive.
Shear, bar 3" United, 24" blade, m.d.
Shear, slit'g, Buffalo 24-S (Armor pl.)
Shear, plate, 16'x¼" L. & A. 20" gap.
Steam turbines, 100 h. p. 900 rev (2).
Valve refacer, Kwik-Way, cabinet base, m. d.
Welder, Arc 150 amp. belted,
Welder, Arc 300 amp. 3/60/220.
Welders, arc, 35 amp., transformer.
Welding & cutting generator, Carbic
Wire str. & C-O—½"x4' Shuster.
Wheel press, 60 ton 34"x8½', b. d.

Partial List. Get Our New Complete Stock List.

FOR SALE BY

The E. L. Essley Machinery Co.

Telephone Lincoln 6320 - - - 831 Rees St., Chicago

Boring bar, Cleveland, 2½" spindle.
Boring mill, 54" Colburn, vertical.
Drill, radial, 5' Fosdick.
Grinder, No. 1 LeBlond tool & cut.
Lathe, 20"x8' Monarch.
Miller, No. 2 Cleveland, universal.
Planer, 48"x48"x12' Cleveland.
Saw, 9"x9" Peerless.
Shaper, 20" and 24" G. & E.
Shaper, 24" Rockford.
Shear, Nia. No 407 A. ring & circle.
Shear, Niagara 8', 3/16" cap.

FOR SALE BY

McDonald Machinery Co., 1535 N. Broadway, St. Louis, Mo.

Air comp., Ingersoll-Rand 7x6.
Bolt mchs., Landis & Acme 1½".
Boring mill, Lucas No. 21 horizontal.
Boring mills, Barrett 5" bar horiz.
Boring mill, Niles 36" vert., 2 hds.
Boring mills, Baush 44" vert., m. d.
Brake, Ohl 10' No 10 ga. m.d. press.
Drills, American 5'; Mueller 2½".
Gear cutter, G. & E. 36" s. p. d.
Gear cutter, G & E. 60" m d.
Gear hobber, G. & E. 24" & 48".
Grinder, surface B & S. No. 2.
Grinder, B. & S. Nos. 10 & 16 plain.
Grinder, P & W. 12" vertical surf.
Grinder, Gardner 52" m.d., horiz. disc.
Lathes, Reed-Prentice 16"x8', q c.g., grd. hd.; Hendey 14"x6', q. c. g.; 50 others in stock.
Milling machines, B.& S. No. 3 univ.
Milling mches., B. & S. No. 1½ Cinc. No. 2, Hendey No. 1-B, Kemp. No. 3; Ohio No. 29; vertical slott, attch., all universal; Kemp. No. 1, LeBlond No. 3-H; Brown & S. No. 3-B, s. p d., Brown & Sharpe No. 3, all plain, Cincinnati 12" Mfg.; Milw. No 3-B s. p. d., d. o. Cincinnati No 3-S pl., s. p. d.
Planer, 60"x48"x10' Gray 2 heads.
Punch press, Fer. No. S8 52 d c. Cons Nos. 1 & 2 o. b. i. Niagara No. 66 D d.c. Ohl d.c.grd.
Shapers, G.& E..S. & M., Cin., Ohio, American, Steptoe, Queen City, 12", 16", 18" 20", 24" and 26"; Cinnnati 24" m d. g. b.
Screw machine, Brown & Sharpe, No. 2 auto.; B. & S. No. 00 Auto.
Turret lathes, W. & S. No. 2 Auniv.

FOR SALE BY

Brown Machinery Co., - - 2333 N. 9th St., St. Louis, Mo

Brake, Chicago Steel, 8' 18 gauge.
Compressor, 7x6" CP Class NSB.
Drills, 14, 16, 20, 22, 24 & 42"
Drill, rail, Foote-Burt.
Drills, 16 & 20 spindle Natco.
Gear hobbers, G. & E. 12" & 24".
Grinders, cylindrical, 10x36" Norton, 12x36" Modern, 8x18" Modern; 12"x42" and 10"x30" Landis.
Grinders, disc, No 6-20 Besly; No. 220 Badger automatic.
Grinder, 8½" Rotary Heald.
Hammers vert. 40 & 80 lb. Perfect.
Lathes, 16"x6' & 8' Monarch q c.g.; 16"x6' & 18"x8' Bradford; 18"x8' American 18"x12' American geared hd., taper & turret attach.; 20"x8' LeBlond, heavy, q. c. g; 36"x12' Putnam, taper attachment.
Millers, plain, No. 1½ American; No. 3½ Fox.
Millers, universal, No. 2 Hendey-Norton; Lincoln type, No. 4 Hendey; slab, Bridges type No. 11.
Planer, 42"x42"x10' Pond.
Planer, 26"x26'x8' Whitcomb.
Presses, straight side, No. 73 Swaine; No. 7 Zeh & Hahnemann, S. S.
Presses, o. b. i. Nos. 1, 2, 3, 4 Longbough-Jordan; V & O No. 01.
Punches, sgl. end. Cleveland "C" 26" thr. ⅝ i n ⅝"; Rock River Style L rapid action, 24" thr. ½" in ½"; No. 6 L. & A 24" thr. ½" in ½"; No. 7 L. & A 10" thr. ⅝" in ⅝".
Punch & shears, dble. end, No. L-10 Badger 10" thr. ½ in ½".
Riveters, No. 5 A High Speed ½" cap.; Grant ½" 18" throat. M. D.
Saw, cold, Higley No. 14.
Screw machines., No. 2½ P. & W.; 1x15" P & W.
Seamer, double, Swaine hand, 24 ga.
Shapers, 20" Columbia.
Shear, rotary bevel, ⅝" Lennox.
Welder, spot, 25 k.w. Agnew 20-D; cap. two ½" pcs., 26" throat.
Welder, butt, Federal, 25 cy., 440 v.
Wood hog, Gruendler, opening 23½x34"

Air compressors, 30 to 2500 cu. ft.
Blower, No. 4 Roots, cap. 2110 c.f.m.
Bolt cutter, 2" Landis, dbl. hd., b. d.
Bor. mills, 24" & 42" Bullard New Era.
Bor. mill, 26" Bullard, side hd., s.p.d.
Boring mill, 42", 2 heads, Bullard.
Bor. mill, 42" Gisholt, 2 hds., m. d.
Boring mill, 48" Gisholt r.p.t., 2 hds.
Boring mill, 62" Betts, 2 heads, b. d.
Boring mill, 12" Niles 2 heads, b. d.
Bor. mill, hor. No. 3 Rochestsr, 3½".
Bor. mill, hor. 5" bar Barrett. m. d.
Brakes, 3' x3/16" D. & K., m. d.
Bulldozers, Nos. 2, 4, 6, 9, 28, & 30.
Cranes, Electric Traveling.
Drill, 2 spindle Avey, b. b., m. d.
Drill, sens. 4-spdl. Avey, belt drive.
Drill, mult 12 sp. Pratt & W., b. d.
Drill, hvy. duty, D-6, 36" Colburn.
Drills, radial, 2½', & 6' Fosdick.
Drill, rad. 3' American, t. a., m. d.
Drill, rad. 4' N. B. P., univ. m. d.
Drill, radial, 4' Prentice, t. a., b. d.
Drill, rad 6' Reed-Prentice, s. p. d.
Drills, upright 10" to 36".
Drill, Baker, table 23½x17", s. p. d.
Drill, upr., No. 153 Baker, m. d.
Engine, gas, horiz., 20h.p. Bessemer.
Flanger, McCabe, ½" capacity, dies.
Gear cutters, 11", 18" & 24" Gleason.
Grinder, disc, No. 2 Gardner, b d.
Grinder, disc, No. 29 53" Besly, m.d.
Grinder, nail die, No. 101 Bridg., md.
Grinders, surf., rotary 8" Heald.
Grinder, emery, wet. wheel, 34x4".
Grinders, plain, 6"x20", b.d.
Grinder, pl., 10"x24" Landis, self-cont.
Grinder, plain, 12"x42", b. d.
Grinder, sur. 14" Pratt & W., m. d.
Grinder, surf. 42" Spring, tbl. 18x84".
Grinder, surf. 48" Diamond, m. d.
Grinder, univ. 12"x36" Cinc., m. d.
Grinder, univ No. 3 Landis, 12x40".
Hammer, Blacker, power, 35-lbs.
Hammer, power, 90-lb Justice, b. d.
Hammers, No. 3-B Nazel.
Hammers, steam, 600 lb. to 6000 lbs.
Hammer, steam drop, 10,000 lb. Erie.
Lathe, 11"x5' Meyers, p. c. g., b. g.
Lathe, 18"x10' Hamilton, q c g. b.d.
Lathe, 20"x10' Southbend, q.c g., b.d.
Lathe, 24"x10' Reed, q. c. g., b. d.
Lathe, 24"x12' L. & S q.c g., t a. b.d.
Lathe, 24"x16' Bridgeford, g. hd. m.d.
Lathe, 26"x18' Wickes g. h. q. c. g.
Lathe, 32"x16' Pond, t. g., b. d.
Lathe, 36"x16' L & S. grd. hd., s.p.d.
Lathe, 36"x18' Putnam. l. c. g., t.a. b.d.
Lathe, 38"x17' Pond. t g, b. g.
Lathe, gun boring 48"x82', m. d.
Lathe, turret, No. 6 Warner & S.
Lathe, turret, 18" Libbr. m. d.
Lathe, turret, 24" Steinle, 6½" hole.
Lathe, spinning, 32"x6' Bliss, b. d.
Miller, pl. No. 2 Kempsmith, b. d.
Miller, pl., No. 24 B.& S. tbl. 17"x72"
Miller, pl., No. 29 Ohio, tbl. 52x11½.
Miller, No. 30 Sunst, Rig. tbl. 12x72"
Miller, rotary 40" Ohio, tilted, m. d.
Miller, spline, Pratt & W., m. d.
Miller, univ. No. 3 Kempsmith, b.d.
Millers, vert. Nos. 4, 4 B & 5C Becker
Nut tapper, Acme, 10-spdl 1½", s.auto.
Pipe mche., No. 304-B Oster, 4", m.d.
Pipe, machine, 2" Williams, m.c.
Pipe machines, 8" Oster.
Pipe machs. 2" & 6" Landis b. d.
Pipe mches., 6" Williams.
Planer, 36"x36"x8' Gray, 3 hds., m. d.
Planer, 42x42"x12' Cinc., 3 hds., b.d.
Planer, 48"x48"x10' N. B. P. 4 hds.
Pl. 56"x48"x12' Det. & H., rev. m. d.
Planer, 60"x60"x16' Pond, 4 hds. m.d.
Planer, 96"x96"x33' 4 hds. rev. m. d.
Press, arbor, No. 17 Green., 18-ton.
Press, No. 3 Bliss, Stiles type.
Press, cam. No. 69N Buss, dbl act. inc.
Press, embossing, Toledo, 400-ton.
Press, embossing, Toledo, 600-ton.
Press, o. b. i. No. 3 Thomas, Bolster 13½"x22".
Press. hor., No. 4-A Cleve. tbl. 15x18".
Press, hor., No. 43 Toledo 1½" stroke.
Press, P-5 Ferracute, stroke 2", m.d.
Press, No. 55 Toledo 20" x19", 2½" st.
Press, No. 64 Cons., 17"x17" str. 4½".
Press, No. 57 Toledo, 32"x32", str. 6".
Press, Toledo No. 59, 8" stroke.
Press, dbl. crank No. 5 Bliss, 2" str.
Press, screw, No. 87 Niagara.
Press, hyd., 200-ton Oilgear, 4 post.
Punch & s., No. 5-H Bertsch hand.
Riveters, air, hammer, spinning.
Rolling mill, 9' x18", m. d.
Roll, angle bending, 2"x2"x½", m. d.
Saw, band, Napier 10x10", m. d.
Saw, hack, No. 2 Robertson, 6"x6".
Saws, friction, Nos. 2, 3 & 4 Ryerson.
Saw, univ. Shaping, 6"x6" Peerless.
Shaper, vert., Jone. 10" stroke, m.d.
Shapers, 16", 20", 24" & 36" G. & E.
Shear, angle, 6"x6"x1" H. & J.
Shears, alligator, 1½", 2", 3" & 4".
Shear, bevel, Lennox ⅜", b. d.
Shear, cir. & flan. No. 208A Nia.
Shear, o.e. No 17 K. New Doty, 4½" rd.
Shear, sq. 10"x18 ga. Niagara, m. d.
Shear, 16"x½" L. & A., 20" gap m. d.
Shear, slit., O E. cap. ⅜", 14" blade.
Shear, rot. Yoder, 24" thrt. cap. ⅜".
Sheet metal cut., No. 1 & 1-A Gray.
Sheet metal cut, No. 2 Campbell 3/8".
Slotter, 6" Newton, 21" table, m. d.
Slotter, 15" Dill.
Straightener, 2-A Kane & R. 20-roll.
Straightener, 1½" 4" rd. Abramson.

USED AND REBUILT MACHINERY

FOR SALE BY

Brownell Machinery Co., • 150 Pine St., Providence, R. I.

Drill, 5' American univ. radial.
Grinder, No. 55 Heald cylinder.
Lathe, 60"x30' Pond.
Lathe, 32"x28' New Haven.
Miller, No. 3 Hendey universal.
Planer, 42"x36"x12' Whitcomb, 4 hds.
Planer, 24"x24"x6' Whitcomb.
Shaper, 20" Gould & Eberhardt.

FOR SALE BY

Chas. E. Wain Machinery Sales, 7800 Mack Ave., Detroit, Mich.

Drill, 3½" radial.....$250.
Drill, mult., No. 13 P. & W. ... 150.
Grinder, 65 Heald cylinder..... 100.
Grinder, Gisholt tool..... 100.
Grinder, No. 11 B. & S..... 225.
Mill, 5 B Becker ..... 375.
Turret, No. 3 Foster..... 100.
Turret, No. 5 Foster.....190.
Wood jointer, 16"..... 85.
Wood jointer, 12"..... 50.

FOR SALE BY

E. L. Klauber Machinery Co., 320-322 South Third St., St. Louis

Drills, Hi-speed b. b. 7" overhang.
Drills, 2 spindle adjustable heads.
Drills, 2 spindle, adjustable heads.
Drill, U. S. electric radial.
Melting furnace, Eclipse and U. S.
Lathes, 14", 18", 20" and 24",
Planer, 15"x15"x36" and 30"x30"x8'.
Riveting machine, No. 2 Grant.
Screw machines, hand 7/16" bar fd.
Turret lathe, No. 2 W. & S.
Turret lathe, No. 4 Brown & S.

FOR SALE BY

Behlen Machinery Co., • • 4744 12th St., Detroit, Mich.

Drill, 2 B Edlund. 1 and 3-spindle.
Drills, No 2 & No. ½ Avey, 1-spdl.
Drills, 21" & 24" Cincinnati, 1-spdl.
Forming & lock seaming mch..Stolp
Grinder, No. 19 Besley, 53".
Grinder, comb. face and univ. disc. Gardner, hyd. table, large.
Mills, hand, Sundstrand heavy duty.

The above are a few items of special interest. We have a large stock to choose from. Send us your requirements.

FOR SALE BY

Bradley Machinery Co., 529 E. Jefferson, Ave., Detroit, Mich.

Drill, Natco multiple.
Drill, Barnes 3 spindle.
Drill and mill, No. 1 Knight.
Grinder, disc, Gardner No. 6.
Grinder, plain, No. 12 B. & S.
Grinder, surface, No. 3 W. & M.
Hammer, 500 lb. Bradley.
Lathes, all sizes.
Lathe, 12"x8' P. & W., collets.
Mill, Waltham thread.
Tapper, Garvin.

FOR SALE BY

J. Horst Mfg. Co., • • • 1008 South St., Lafayette, Ind.

Band saw, 30", for wood.
Drill, 20" Superior.
Grinder, Oakley No. 2 universal tool and cutter.
Grinder, Wood universal tool and cutter.
Lathe, Lodge & Shipley, 18"x8', s. p. d., q. c. g.
Lathe, American 18"x8', geared head, q. c. g.
Motor, G. E., 10 h. p., 1750 r. p. m., 3 phase, 220 v.
Motor, Wagner 7½ h. p., 1150 r. p. m., 3 phase, 220 v.
Shaper, Rhodes combined shaper and slotter, with all attachments.
Turret lathe, Wood tilted turret No. 6, 2" bar capacity.

USED AND REBUILT MACHINERY

FOR SALE BY

Wigglesworth Machinery Company

199 Bent Street, - - - - Cambridge, Mass.

Automatic, ⅜" G. Gridley ser. 16,000.
Boring mill, Cleveland 2½" bar.
Gear hobber, 18' H Gould & E.
Miller, No. 2-B Brown & Sharpe.
Miller, 67x52x16' Ingersoll, 4 heads.
Radial, 4' American.
Thread roller, 2C Manville, m. d.
Turret lathe, 1A Warner & Swasey, Timken bearing.

Send for Complete Stock List.

FOR SALE BY

Scott-Bansbach Machinery Co., 4607 West 20th St., Chicago, Ill.

Miller, No. 1, Burke, hand, dividing head	$ 90.
Miller, Chicago, hand, centers, bench type	85.
Miller, Wisconsin hand, on pedestal, 12"x4"x8½"	125.
Miller, No. 2, Becker, vertical, arranged m. d	375.
Miller, No. 2H B. & S. plain, cone type, with vise, c/s and arbors	400.
Miller, No. 5, B. & S. plain, cone drive, capacity 48x12x18	750.
Miller, No. 7 Becker, Lincoln type	75.
Motor, 20 h.p. Fairbanks, slip ring, 220, 60, 3, 360 to 720 r.p.m., compl.	150.
Motor, 20 h. p. Marble card, 220 v., 60 cy., 3 ph., 1200 r.p.m., complete	175.
Motor, 20 h. p. G. E., 220 v., 60 cy., 3 ph., 1145 r. p. m., complete	175.
Motor, 25 h.p. Wagner, 220 volts, 60 cycle, 3 phase, 1140 r. p m.	200.
Planer, 17"x18"x3' 6", no name, 1 head	150.
Planer, 24x24x6 Ohio heavy duty, 1 head	350.
Planer, 72x72x12 Gray, 4 heads	1,500.
Press, No. 4 Greenard with ratchet, floor type, adjustable table	85.
Press, No. 0 Hercules, bench type, ⅜" str., 115 lbs. Fly Wheel 25 lbs.	50.
Press, No. 2 Walsh O. B. I., 2" stroke, 12 tons, 1025 lbs.	175.
Press, No. 2, Thomas, o. b. i., 2" stroke, 15 tons, 1600 lbs.	175.
Press, No. 20 Bliss o. b. i. 2½" stroke, 28 ton, 2300 lbs.	250.
Press, No. 21 Bliss o. b. i., 2" stroke, 37 ton, 4200 lbs.	250.
Press, No. 75 Cons. gap frame, comb. grd. 2" stroke' 65 ton, 11000 lbs.	700.
Press, No. 2 solid back, 1½" stroke, 25 ton, 1500 lbs	100.
Press, No. 51 Toledo arch, 2½" stroke, 56 ton, 5300 lbs.	350.
Press, 1½S, Robinson, dbl., cr., pl., 3" str., gap type, bet. 37", arr. m. d.	350.
Punch, shear and bender, No. 23 Armstrong-Blum	100.
Punch, Kneeland, 10" throat, shears ⅝"x1" flats	100.
Riveter, Grant, spinner, No. 80-A, horn table ⅝" capacity	75.
Riveter, No. 3A, high speed hammer, cap. ⅜", motor shelf	150.
Riveter, No. 4A, High speed hammer, ⅝" capacity, no ctrsft.	200.
Riveter No. 5 A, High speed hammer, cap. ¾", motor shelf	275.
Saw, No. 2 Klem, band, for metal cutting, belt drive	300.
Scleroscope, Shore complete with stand and blocks, model C	125.
Screw machine, No. 1 B, Foster 13/16" capacity, plain head	200.
Screw machine, No. 2 Warner & Swasey, plain head, 1" capacity	225.
Screw machine, No. 2 Pierce, 1" capacity, plain head	150.
Screw machine, No. 2 Foster friction head	150.
Shear, 30" Bertsch, 16 gauge, 12" gap, foot power	75.
Shear, 10" Niagara circle, No. 20 gauge, cuts 58" dia. circle	40.
Shear, Niagara, No. 05, circle, No. 18 ga., 4" to 48" circles	75.
Separator, American, capacity 1½ bushels, belt driven	200.
Shaper, 14" Rockford single geared, crank, vise and countershaft	225.
Shaper, 16" Steptoe, back geared, crank, vise and countershaft	250.
Shaper, 16" Smith & Mills, back geared crank, vise and countershaft	300.
Shaper, 24" Walcott, H. D., back geared crank, vise and c/s	400.
Tapper, No. 1 Garvin Automatic, capacity ⅝" iron, ½ steel	75.
Tapper, R. & S., ⅝" capacity, horizontal, on pedestal	75.
Turret lathe, No. 5 Foster, geared head, s. p. d., cap. 1 13/16"	500.
Turret lathe, 2½x10" Milholland, for chuck and bar work	400.
Vertical attachment for No. 2 Brown & Sharpe miller	100.
Welder, butt, Toledo, 8 KW., capacity ½" round	150.
Wire straightener, Shuster, 3/16" capacity, 8 foot carriage	250.

FOR SALE BY

Davis Machinery Co., St. Clair & Washington Sts., Toledo, Ohio

Broach, No. 2 J. N. La Pointe dbl.
Drill, No. 2 Avery 2-spul. h. s., b. b.
Drill, No. 2 Coburn, mfg. type.
Grinder, disc, No. 6 Gardner, b. b.
Hammer, No. 1 Standard strap drop.
Lathe, 13"x5' South Bend, q. c. g.
Lathe, 18"x8' Sidney, q. c. g.
Lathe, 28"x18' Pittsburgh, q. c. g.
Lathe, 16"x8' Hendey, q.c g., t.&col.
Lathe, 18"x8' Walcott, q. c. g.
Lathe, 16"x8' Walcott, q. c. q.
Mill, No. 3 Kempsmith, plain.
Mill, No. 5B Brown & S pl., s. p. d.
Mill, 24" Bullard vert. boring.
Press, No. 53 Toledo, SS.
Sander, 15" Pe ess vert. belt.
Screw driver, No. 1 Reynolds.
Shaper, 7" Rhodes, vert & hor. hds.
Shaper, 15" & 24" Potter & J., crk.
Square shears, 48"x10 ga. Bertsch.

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Automatic, ¾" cone, m. d.
Broach, No. 3 LaPointe, double.
Cock grinder, Turner 4-spindle, 1".
Drill, No. 216 Baker hy. service (2).
Drill, Natco, No. 14 22-spindles.
Drill, 4-spindle Barnes, adj. head.
Gear cutter, No. 4, 36" Brown & S.
Keyseater, No. 2 Catlin, 2" capac'y.
Lathe, 14"x6' Monarch, q. c. g.
Lathe, 20"x10' Boye & Emmes.
Lathe, 21"x10' LeBlond hvy duty.
Miller, No. 33 Brown & S. auto.
Miller, No. 3 Kempsmith univ.
Miller, No. 2 Cin. py'mid base, m.d.
Miller, No. 4 Cinc., rect. arm, m. d.
Planer, 24"x6' Gray, like new.
Press, No. 5 Bliss Stiles 90%.
Press, No. 24 V.& O., solid back, 90%.
Press, No. 27G Stoll horning, m. d.
Pump, Watson-Stillman 4-plunger.
Shaper, 16" Whipp, like new.
Saw, Racine 6"x6".
Special, Morton 60" combination boring, milling & draw cut shaping mche.

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Boring mill, 96" Detrich & Harvey horizontal floor type.
Chucking machine, No. 454 New Britain.
Die sinkers, Nos. 2 & 3 Pratt & W.
Drill prod., 216 Baker, No. 2 Colburn, m. d.; No. 2 Avery, 12" overhang.
Electric oven, Young Bros. 72x54x29"
Gear tooth rounder, Cross, m. d.
Grinder, No. 12 Bryant, motor drive, late type.
Grinder, 6x18 Landis, s. p. d.
Grinders, Nos. 12 & 15 Teromatic int
Grinders, Nos. 70 & 75 Heald inter.
Grinder, No. 2 Brown & S., No. 1½ abrasive surface.
Grinder, No. 8 Badger, pwr. fd. tbl.
Gas truck, Clark Hi lift.
Lathe, No. 8 Rivett precision bench, motor drive.
Lathes, No. 3-D Gardner polish. m.d.
Lathes, Nos. 2, 4, 6 W. & S. turret.
Mill, No. 2-B Brown & S., s. p. d.
Tapper, 16-spindle Fox, motor dr.

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Chas. L. Molitor Machinery Co., 120-124 S. Clinton St., Chicago, Ill.

LATHES.

20"x8' American, q. c. g.
20"x10' Cisco.
17"x6' LeBlond t., q.c.g. hvy. duty.
16"x8' Cincinnati, q. c. g.
14"x6' Hendey.
13"x6' LeBlond gap, q. c. g.

MILLING MACHINES.

No. 3 Kempsmith universal.
No. 2 LeBlond universal.
No. 2 Brown & Sharpe universal.
No. 3 Brown & Sharpe plain.
34x12x20 Oesterlein rapid prod.
No. 1½ Cincinnati plain.
No. 1½ Rockford plain.
No. 0V Brown & Sharpe.

MISCELLANEOUS.

16" motor driven high speed shaper.
4' American radial.
Reed-Prentice production lathe.
3/16" wire straightener and cutter.
No. 1, 2, 3, 4 W. & S. screw mchs.
No. 5 double crank cam presses.

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Ott Machinery Sales, Inc., - 548 Second Ave., Detroit, Mich.

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Drills, h.s., b.b. Allen, Avey, Leland & Gifford 4-spindle No. 2.

Drill, rad. Prentice 4'; Mueller 4'.

Gear shapers, Fellows Nos. 6, 61, 7, 712 and 75 high speed.

Gear generators, Gleason 8" mfg. st. bevel; Gleason 15" spiral bevel, roughers and finishers; No. 5A Lees-Bradner.

Grinders, Brown & S No. 13, tool No. 2 B. & S., univ. & surface; Cincinnati No. 3 Univ. 12x48".

Heald No. 60, 65, 70, & 75.

Lathes, Reed-Prentice 14"x6' q. c.; Springfield 16"x6' relieving and taper attach.; Hendey, 16"x8'; Flather 16"x6; Hamilton g.h. 14"x6'

Lathes, turret, Acme 3½"x36" g. h.; J. & L. 2"x24" & 3"x36"; Warner & Swasey Nos. 2, 4 & 8.

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Adj. Speed—230 Volt

H. P.	TYPE	SPEED
1—1500	West.	470/ 600
1— 250/410	Cr. Wh.	1000/1200
2— 150	G. E.	1000 1200
2— 125	West.	240 600
2— 120	G. E.	300/ 750
3— 80	Diehl	500/1100
1— 75	G. E.	300/ 900
2— 60	El. Dy.	450/1200
5— 60	El. Dy.	525/1050
2— 50	West.	225/ 600
1— 40/50	Cr. Wh.	175/ 700
1— 40	West.	300/ 900
1— 40	West.	600/1200
1— 35	Cr. Wh.	800/1600
12— 25	West.	650/2200
2— 20	West.	375/1500
1— 20	West.	550/1100
2— 20	G. E.	500/1500
20— 10	West.	500/1500
25— 7½	West.	400/1600
26— 5	West.	400/1600
1— 5½	West.	600/1800
10— 3½	West.	450/1800
15— 2½	West.	450/1800

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1—1500 k. w., G. E., type-M. P. C., D. C. Gen. 250 v., com'd inter pole, conn. to 2150 h. p., 8 P. F., type ATI, synch. motor, 11,431/6600 v., 360 r. p. m., 3 ph. 60 cy.

1—1000 k. w., G. E. type-M. P. C., D. C. Gen. 250 v., conn. to 1400 h. p. type ATI, synch. motor, 6600/2300 v., 514 r. p. m., 3 ph. 60 cycle.

1—500 k. w. West. D. C. Gen. 250 v., conn. to 710 h. p., 8 P. F. synch. motor 4600/2300 v., 1200 r. p. m., 3 phase, 60 cycle.

1—200 k. w., Crocker Wheeler type 149DA comp'd. inter pole, 250 v., D. C., conn. to 30 h.p., Sq. Cage. A. C. motor, 2300/440 v., 720 r. p. m., 3 ph., 60 cy.

A. C. MOTORS
Synch. Type

H. P.	TYPE	VOLTS	SPEED
1—2850	G. E.	2300/4150	450
1— 675	Al. Ch.	2200/ 550	900
1— 600	G. E.	2200/ 550	257
1— 260	Al. Ch.	2200/ 440	720
1— 125	West.	2300	900
1— 50	G. E.	440/220	1200
1— 35	G. E.	440/220	1200

SLIP RING

1—1200	West.	2200	360
1— 600	G. E.	2300/550	257
1— 600	G. E.	2300/440	705
1—450/360	West.	2200	875/700
1— 400	West.	2300	514
1— 400	West.	550	505
1— 300	G. E.	550	575
1— 250	F. Morse	2200	1200
1— 250	West.	2300/440	700
2— 200	West.	220/440	900
1— 200	G. E.	220/440	900
1— 150	G. E.	440	1750

SQUIRREL CAGE TYPE

1— 300	Cr. Wh.	2300/220	580
1— 250	West.	2300/440	580
1— 150	G. E.	220/440	900
1— 150	West.	220/440	720
1— 150	West.	220/440	580

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United Machinery & Supply Co., 1241 Walton Ave., St. Louis, Mo.

Brake, box and pan, 5' D. & K.
Brake, 8' 16 gauge capacity.
Crane, 2 ton 40' 3 a. c. motors.
Drill, 10-spindle Moline.
Grinder, No. 13 B. & S., accessories.
Hammer, 25 and 50 lb. Beaudry.
Press, No. 3 trimming, b. g., m. d.
Saw, friction, 50", motor drive.
Shear, 12'x10 gauge Niagara, m. d.
Shear, 12'x3/16" D. & K., m. d.

FOR SALE BY

John A. Stockman, - - - - Homesdale, Pa.

Bench lathes, Hardinge, 1" capacity, 21 collets and 15 collets (2).
Bench lathe, No. 4 Stark, 9 collets, 6-hole turret attachment.
Bolt threader, Landis, 2 heads, 1" capacity, b. d., dies, pump.
Lathe, Pratt & W., 11"x5', draw bar, collets, taper, pan bed, chuck & gears.
Lathe, Lodge & Shipley 16"x6', q. c. g., taper, chuck, b. d.
Lathe, Lodge & Shipley, 20"x8', q. c. g., 18" 4-jaw chuck, patent countershaft.
Lathe, Hendey, 20"x10', yoke head, draw bar, 12 collets, 2 chucks, taper attachment; serial No. 23800.
Lift trucks, National Champion hydraulic, (2).
Miller, No. 1 Cleveland universal, s. p. d., complete.
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Press, car wheel, 300-ton Niles.
Wire formers, Nilson four-slide (4).

FOR SALE BY

Reliance Machinery Sales Company

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Corrugating rolls, 60", belted.
Drill, 4 spdl. 20" Barnes, all geared.
Drill, 3 spindle, 26" Barnes, t. a.
Drill & tap., No. 314 Baker, cap. 3".
Grinder, surface, No. 2 Wil. & M.
Lathe, 48"x32' Pond, triple geared taper attachment.
Lathe, 24"x12' B. & E., q. c. g., t. a.
Lathes, spinning, No. 6 Bliss & 326 Toledo, roller bearing spindles.
Lathe, 48"x20' Betts-Bridge, grd. hd.
Millers, vert., 5B and 8C Becker.
Planer, 36"x10' D. & H., openside.
Press, dbl., crank, 10' wide, 7" shaft.
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Presses, No. 16 Bliss horning.
Press, No. 3½C Bliss toggle.
Punch & shear, L. & A. cap. 1 thru 1", with angle blades, etc.
Shaper, 36" G. & E. cone drive.
Shear, 72"x16 ga., M. D.
Welders, 200, 300, 400 amp. Lincoln, motor end 3-60-220-v. a. c.

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The O'Brien Machinery Co., 113 N. Third St., Philadelphia, Pa.

Boring mill, 24" Bullard, rap. prod., threading attachment.
Boring mill, 3½" bar Gidding & Lewis horiz. table 23"x45".
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Drill, 32" Cin. Bick. upright, s.p.drive.
Drill, 3½' Cin.-Bick. radial, s. p. d.
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Hammer, 100 lb. Bradley, helve.
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Hammer, 1100 lb. NBP, steam forg.
Hammer, 2000 lb. Chambersburg double frame steam.
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Lathe, 24"x18' American, s. p. drive.
Lathe, 16"x9' Chard, cone drive.
Lathe, 18"x8' Champion, belt drive, with taper attachment.
Miller No. 3 Hendey Universal tbl., 48"x11", belt drive.
Miller, No. 4B Becker vertical, table 10"x26".
Pipe machines, 2, 4, 6, 8 and 12" belt and motor drive.
Punch, No. 2 Southwark ⅝x⅝", mtr.
Shapers, 14, 16, 20 & 24" various makes
Shear, 8' Niagara, 15" gap, 3-16" cap.

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Goldsher Machinery Co., - 817 W. Lake St., Chicago, Ill.

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Hoists, chain, 2, 3, 4 and 5 ton.
Hoist, electric, Cleveland 2 ton.
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Presses, Bliss No. 20B with double roll feed, 2" str. OBI. late type..... 400
Shaper, 16" G & E, high duty, single pulley, like new..... 700

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72"x72"x18' — **Niles Bement Pond, Late Type, 4 Heads, Box Type Table, Reversing Motor Drive.**

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No. 3 Van Norman Duplex, arr. m.d.
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No. 2 P. & J. dbl , table, auto.
No. 2A, heavy, B. & S., univ.
4" Newton, double spdl. spline mill.
No 22 Garvin, vertical mill.
Model B Becker, vert., 24" rot. tbl., m.d.

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3 spindle Avey, No. 2 high speed.
2-spindle Leland & G. h.s., pwr. feed.
2-spdle. Allen, high speed power feed.
No. 416 Baker, heavy duty, 5" cap.
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Cinc. uprights, from 21" to 36", (20).

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No. 4 B. & S. universal, belt drive.
14x36 Queen City, self contained.
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No. 13 Brown & Sharpe universal grinder with full equipment.
No. 1 W. & M. univ. tool & cutter.

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18"x8' Monarch q. c. belt drive.
16"x6' Amer. cone dr., taper att., q.c.
16"x8' Monarch, q. c. belt drive.
16"x6' Sidney, q. c., t. a. belt drive.
14"x8' Sidney, all geared, m. d., q. c.
12"x5' Hendey q. c. belt drive.
14" W. & S. p. h. turret, auto. chk. (6)
No. 4 W. & S. f.g.h. hand scr. mche.
No. 5 Foster f.g.h. hand screw mche.

PRESSES

No. 73 Bliss Cons., o. b., gap frame arranged for motor drive, (2).
No. 20 Bliss, plain, o. b. i.
No. 54 Toledo s. s. pl in.
No. DDG4 Ferracute cam-drawing.
No. 5 Bliss, double crank 3" stroke.

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No. 26 Williams & White bulldozer.
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Landis ½" double hd. bolt cutters, (2).
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2½" bar Cleveland hor. boring mill.
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48x48x14 latest pe Cincinnati double housing planer, 4 heads.

Over 750 machines in stock. Full specifications and photographs mailed on request.

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4 sp. Taylor & Fenn, No. 2 m. t.
No. 2B Edlund hsbb; 8" overhang.
No. 2 Avey hsbb; 7½" overhang.
No. ½ Avey hsbb; 5/16" cap.
⅜" L-G hsbb; 12" overl ang.
26" Barnes sldg. hd., tapp. att.
25" Barnes st. hd; power feed.
24" Barnes camel back, No. 4 m.t.
22" Barnes sldg. hd; tapp. att.
20" L-G hsbb; power feed.

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No. 2 Wilmarth & Mormon surf.
No. 70 Heald internal (wet).
8" Heald rotary surface.
No. 1 W. & M. univ. tool & cutter,
No. 3 Ohio universal and tool.
No. 2 B. & S. cutter, 6"x18" ctrs.
16"x32" Landis plain crankshaft.
No. 1 LaSalle hand surface.
1—31/32" Blau twist drill.
24" Ingersoll milling cutter.

LATHES

3A W. & S. universal turret.
No. 3 Foster universal turret.
No. 0 B. & O. turret, cap. ⅜" rd.
10"x48" Champion bench, p. c. g.
12"x5' Hendey q. c. g.; taper att.
13"x5' South Bend p. c. g.
13"x6' South Bend q. c. g.
14"x6' Monarch q. c. g.; taper att.
14"x8' Carroll & Jamieson q. c. g.
14"x8' Rockford q.c g.; draw bar.
16"x6' C. & J. grd. hd.; motor dr.
16"x8' Van Wyck; q. c. gears.
20—42"x8' Fay & Scott ext. gap.

SHAPERS

7" Rhodes horizontal crank.
12" Whipp crank, single geared.
16" American crk., rev. tbl.; b. g.
16" Smith & Mills crank, sgl. grd.
16" Smith & Mills crank, b. g.
25" Smith & Mills crank, b. g.
28" G. & E. hi-duty crank, b. g.

MILLERS

No. 3 Kemp. univ.; vertical head.
No. 2½ Rockford univ.; spiral att.
No. 2M Cin. univ.; s.p.d.; full eq.
No. 2 Cincinnati univ.; cone dr.
No. 2 Becker vertical, draw bar.
No. 1½ B. & S plain, cone drive.
No. 1½ Valley City univ.; equipt.
No. 1 Kempsmith univ.; spiral att.
No. 1BK. & T. univ. dbl. overarm.
No. 1 United States hand.
24" Cincinnati automatic plain.
No. 5B Becker vertical.
No. 2 Garvin duplex.

PRESSES

No. 1 Bliss cam drawing, geared.
No. 1½ Bliss cam drawing.
10 ton Metalwood hyd. forcing.
No. 30A Perkins o. b. i.; 1⅞" str.
No. 39 Bliss horning and wiring.
No, 73W Bliss straight side.

SAWS

6"x6" H. & R. metal band.
6"x6" Peerless high speed.
No. 40 Robert'n h.s.; No. 2 Marvel.

MISCELLANEOUS

No. 6 B. & S. auto. screw mche.
No. 3 B. C. gear hob., pwr. vert.
No. 3 B. C. gear hobber.
No. 12 B. C. gear hobber.
No. 12H G. & E. gear hobber.
4'x1½" Bliss power shear, m. d.
2½" Cleve. hor. boring mill, s.p.d.
3" Lucas horiz. boring mill, s.p.d.
No. 2 Davis Keyseater, ⅝" cap.
No 0 Baker Keyseater, 1" cap.
1½B,2A,3A H.S. rivet. hammers.
1" Landis bolt threader, single hd.
4'x14 ga. D. & K. pan brake.
Model "C" Shore scleroscope.
Carl Zeiss optimeters.
D. E. Whiton centering machine.
2G B. & S. auto. screw machine.
2½", 4½", 7¾" Clev. auto; model A.
18"x96" Norton cyl. grinder, plain.
No. 3 Farwell gear hobber.
3" Beaman & Smith horiz. mill.
5" Beaman & S. horiz. mill; floor type, 40"x102" sliding table.

OTHER HIGH GRADE TOOLS IN STOCK

PARTIAL LIST—LET US QUOTE YOU

GEO. M. BERNSTEIN & CO.

12 SO. CLINTON ST., CHICAGO, ILLINOIS

—READY FOR SERVICE—

Automatics
No. 00 Brown & Sharpe.
4¾" Gridley 1-spindle.

Boring Machines (Hor.)
No. 6 Defiance, 4¾" bar.
No. 2 Lambert, 4" bar.
No. 2 Lucas, 3¾" bar.
No. 3-A Universal, 3" bar.
No. 1 Cleveland, 2¾" bar.

Boring Mills (Vertical)
24" Bullard, "New Era".
32" King.
36" Bullard "New Era"
42", 48" and 60" Colburn.
52" King, motor drive.
72" King.
7'—12' Betts Extension.

Drills (Ball Bearing)
1, 2, 3, 4 Spindle L-G.
1, 2, 3, 4, 6 Spl. Henry & Wright.
2 and 4-spindle Avey.

Drills (Mfg.)
No. 2 Colburn, 2 and 4-spindle.
24" Cinn.-Bick., slid. head.
No. 2 & No. 4 Bausch mult.

Drills (Radial)
3' and 3½' Carlton.
3½' and 5' Fosdick.
6' Western.

Gear Cutters
Nos. 3 & 12 Barber-Colman.
Nos. 9-H & 18-H G. & E. hob.
No. 16HSB Gould & Eberhardt.
Nos. 7, 6, 65, 615 Fellows.
No. 6—72" Brown & Sharpe.
6" & 18" Gleason bevel gear.
37" Gleason bevel planer.

Grinders (Plain)
Nos. 10, 11. 12 B. & S.
6"x32" Norton.
10"x18", 24", 36" Norton.
10"x50", 72", 96" Norton.
10"x36", 52" Landis.
14"x36", 50", 72" Norton.
18"x96" Norton, m. d.
20"x168" Landis, m. d.

Grinders (Univ.)
No. 13 B. & S., cutter & tool.
No. 2 & No. 2½ Bath universal.
No. 2 Brown & Sharpe.
No. 4—12"x66" Landis.

Grinders (Misc.)
No. 1½ Landis, Internal.
No. 70 Heald, Internal
16" Heald rotary surface.
No. 10 Blanchard, surf., m. d.
No. 16 Blanchard surface.
14"x36" P. & W. vertical surface.
No. 33 Abrasive, surface.
18"x17"x72" Norton, o. s., surf.
36"x84" Diamond, hyd. face.

Lathes
No. 3 L. & S. Duomatic.
No. 12 LeBlond Multi-Cut.
14"x6' Lodge & Shipley.
16"x8' American; taper rel. att.
18"-20½"x8' L. & S. sel. g. h.
20"-22½"x8', 14' L. & S. sel. g. h.
24"-27½"x12', L. & S. sel. g. h.
25"—27"x26' LeBlond.
30"—34"x12' L. & S., sel. g. h.
27"—30"x16' L. & S., sel. g. h.
36"-40½"x14' L. & S. sel. g. h.
36"x30' Rahn-Larmon grd. hd.
66"x21', 36' Putnam t.g., m. d.

Millers (Plain and Universal)
Nos. 0, 3-B, 4-B B. & S.
Nos. 1-B and 2-B Milwaukee.
Nos. 2 & 3 Cinn. h. p., s. p. d.
No. 3-B Milwaukee, s. p. d.
Nos. 4 & 5 Cinn. h. p., s. p. d.

Millers (Mfg.)
4—36 Cincinnati hydromatic.
34—48 Cincinnati hydromatic.
18" & 24" Cincinnati automatic.
No. 33—60" Kempsmith.
No. 4 & No. 6 Lees-Brad. Thread.
Hanson-Whitney thread.
36"x36"x12' Newton Duplex.
24"x20' Ingersoll fixed rail.

Millers (Vert.)
No. 1½ Milwaukee.
No. 3 Cincinnati h. p.
No. 4 Cincinnati, h. p., s. p. d.
No. 5 Brown & Sharpe.

Planers
24"x24"x12' Gray.
30"x30"x6', 18' Cincinnati.
36"x36"x8', 18' Cincinnati.
36"x36"x12' and 24' Gray.
48"x48"x10' Gray.
48"x48"x12' Cleveland, openside.
48"x48"x14' Liberty, openside.
48"x48"x16' Cleveland openside.
56"x56"x32' Cincinnati.
60"x48"x16' Gray max. service.

Presses
No. 14½ Toledo Horning.
No. 96-F Toledo, double crank.

Shapers
16" Gould & E. late type.
20" Cincinnati, m. d.
20" American, s. p. d.
20" Gould & Eberhardt.
24" Gould & E., "Invincible".

Turret Lathes
No. 1-A Warner & Swasey.
No. 2-A Warner & Swasey.
No. 3A Warner & Swasey.
No. 2-B and No. 3-B Foster.
No. 4-L Gisholt, 9½ h. s.

HILL-CLARKE MCHY. CO.

645 Washington Blvd., Chicago, Ill.

Tools Offered at Bargain Prices

PUNCHES

No. 15 W.-W., ⅞" thru ¾", 24" throat, motor drive.
No. 14 Williams & White 1¼" thru 1", 25" throat dbl. end, motor drive.
Size A, L. & A., 2" thru 1⅛", 36" throat, motor drive.
L. & A., 1½" thru 1", 36" T. m. d.
No. 2H. & J., hor., 1" thru 1", 15" gap, motor drive.
No. 3 H. & J., 1½" thru 1"; Shear 2½' rd., 30 T., motor drive.
No. 5 Beatty flyw., ¾" thru ½" m. d.
No. 7 Beatty 42" throat, motor drive.
Kling s. e. punch 2¼" thru 1¼", 18" throat motor drive.
Rock River, ⅞" thru ¾", 36" T. m. d.
No. 2 H. & J., barshear, 1¼" rd., m. d.
No. 1 H. & J., barshear, 1½" rd., m. d.
No. 000 H. & J., bar shear, 1" rd., m. d.
No. 0 Yankee punch, 10 gauge, b. d.
No. 66 Niagara hand power punch, ½" thru ⅞".

SHEARS

Scully rotary shear, ½" capacity m. d.
No. 6 H. & J., ⅞"x96", 36" thr., m. d.
No. 6½ H. & J., 1"x96", 36" thr., m. d.
Loy-Nawrath, 3/16"x10' back gauge, motor drive.

PLATES—TOOL

D. & K., ⅜"x12' leaf brake, m. d.
No. 2 H. & J. leveling roll, 50" wide.

BULLDOZERS—BENDERS

No. 5 W-W, Bulldozer, b. d.
No. 7 W-W, Bulldozers, b. d.

HAMMERS

2—75 lb. Bradley upright helve, b. d.
1—80 lb. Bradley upright helve, b. d.
1—Nazel 100 lb., motor drive.

CRANES

2—Shaw, 7½-ton, span 57', d. e.
1—Erie, 7½-ton, span 57', d. e.

AIR RIVETERS

Allen, ⅝", 6" reach, 8-⅝" gap, (2).
Hanna, 10", cyl., 8" reach, 8" gap.
Allen, ⅞", 8" reach, 8" gap (3).
Hanna, ⅞", 8" reach, 8¼" gap, (2).
Hanna, ⅞", 8" reach, 13½" gap.
Allen, ⅞", 8" reach, 13-⅞" gap, (2).
Allen, ⅝", 34" reach, 15" gap.
Allen, ⅝", 47" reach, 15" gap, (2).
Hanna Yoke, 12"x12", 30-ton.
Lake Erie stake, 75" reach, 18" gap, 50 ton.

MISCELLANEOUS

No. 5-H LeBlond Mill—Rebuilt.
No. 6 Brown & Sharpe gear cutter 72"
No. 2 Brown & Sharpe milling mach.
No. 2A Garvin plain milling mach.
No. 3 Garvin plain milling machine.
No. 4½ Garvin plain milling machine.
14" Barr upright sensitive drill.
20" W. F. & J. Barnes upright drill.
34" W. F. & J. Barnes upright drill.
4' American plain radial drill.
No. 2 Modern universal tool grinder.
1" National washer making machine.
No. 2A Saunders pipe cutter.
Racine hack saw.
14½ G Metropolitan steam injectors.
No. 6 Sturtevant blower.
No. 8 Sturtevant blower.
Acme bolt threader, 2", (3).
B. & K. pipe threader, 4".
Columbus pipe threader, 6".
Geared hand power pipe threader 1¼ to 6", r. and l. dies.
¾" National upsetter cont. motion.
Cleveland wall type radial drill.
Lewis rail breaker, motor drive.
150-ton Putnam wheel press.
Oliver jointer, round head, 20" blades.
Oliver No. 3 wood trimmer.
Beaman & S., open s. slab miller.
Brown & Sharpe vertical pulley lathe, swing 36".
No. 2 Pedrick floor type boring mill, 6" bar, motor drive.
Springfield surface grinder, 30" diameter wheel.

Beatty Machine & Manufacturing Co.
954-150th Street, Hammond, Indiana

MODERN MA

GEAR MACHINERY

10" Pratt & Whitney Hydraulic Gear Grinder, 3 motor drive, for spur and helical gears, latest type.
No. 34 Brown & Sharpe Gear Hobber, motor drive.
No. 18H Gould & Eberhardt Gear Hobber, s. p. d.
No. 12 Barber-Colman Gear Hobber, double overarm.
Nos. 3,12 Barber-Colman Gr. Hobbers, single overarm.
Schuchardt & Schutte Gear Tooth Rounder, belt.
No. 5A Lees-Bradner Gear Generators, 14" and 19" sizes.
6", 11", 18" Gleason Straight Tooth Bevel Gear Generators.
12" Ingle Gear Tooth Rounder.
Nos. 3, 4 Brown & S. Gear Cutters.
Hercules Gear Hobber, belt.
Nos. 6, 61, 612 Fellows Gear Shapers, belt.
Nos. 7, 72 Fellows Gear Shapers, m. d., like new.

MILLING MACHINES

No. 2 Milwaukee Universal, motor in base, Timken Bearings, dial feed.
No. 3 Milwaukee Universal, motor in base, Timken Bearings, dial feed.
Nos. 2, 3, 4 Cincinnati Universal, s.p.d., flanged spindle.
No. 2A Heavy, 4A Heavy Brown & Sharpe Universal, m. d.
No. 2 Brown & Sharpe Universal, belt.
Nos. 2, 3, 4 Cincinnati Vertical, s. p. d., flanged spindle.
No. 2½ Milwaukee Vertical, s. p. d.
No. 6 Reed-Prentice Vertical Improved Miller and Die Sinker, m. d.
No. 6 Becker Vertical, belt.
No. 4B Becker Vertical, m. d.
4" Pratt & Whitney Spline Miller, m. d.
6x14" Pratt & W. Thread Miller, belt.
18", 24", 48" Cincinnati Plain Automatic, s. p. d.
18", 24" Cincinnati Duplex Auto., m.d.
18", 24" Cincinnati Plain, Auto., belt.
No. 3 Sundstrand Rigidmill, m. d.
No. 33 Kempsmith Mfg. Mill, m. d.
C66A Newton 3 spindle Continuous Miller, s. p. d.
48" Oesterlein Tilted Offset Miller, m.d., National Standard spindle, Timken bearings, brand new.
Nos. 2M, 3, 4, 5 Cincinnati Plain Milling Mche., s. p. d., flanged sedle.
Nos. 4B Heavy 5B Heavy Brown & Sharpe Plain, m. d., p. r. t.
Nos. 1, 3 Kempsmith Plain, cone.
No. 1B Milwaukee Plain, m. d.
No. 3B Milwaukee Plain, m. d., double overarm.
No. 13B Brown & Sharpe Plain, National Standard Spindle.
Nos. 1, 3 Kempsmith Plain, cone.
Nos. 1, 2, 3, 4 Cincinnati Plain, cone.

GRINDERS

Nos. 2, 3A Cincinnati Universal, belt.
No. 3 Brown & Sharpe Universal, belt.
Nos. 1½, 4 Landis Universal, belt.
Nos. 50, 55, 60, 65 Heald Cylinder.
Nos. 70, 75 Heald Internal.
Nos. 24—53" Gardner Horizontal Disc.
No. 120 Gardner Combination Disc.
No. 1½ Cincinnati Univ. Tool & Cutter.
No. 2 Oesterlein Tool & Cutter.
Nos. 31, 41 Oliver Drill, m. d. in base.
No. 4 Gardner Disc, b. b.
Nos. 2, 3 Brown & S. Auto. Surface.
No. 2 Diamond Surface.
No. 2 Wilmarth & Morman Auto. Surf.
No. 78 Wilmarth & Morman Automatic Surface, motor in base.
18x48" Diamond Light Duty Face.
No. 25 Heald Rotary Surface, m. d., hydraulic feed.

EASTERN MACHINERY CO.,

CHINE TOOLS

60" Bridgeport Automatic Face.
60" Springfield Automatic Face.
8x36" Cincinnati Saddle Type, m. d.
8x18" Cincinnati Saddle Type, m. d.
10x18" Cincinnati Saddle Type, m. d.
6x18", 10x24", 10x30", 10x36", 10x52", 10x72", 12x36", 12x52", 12x72", 12x120", 16x32", 16x52", 16x72" Landis Plain Cylindrical, m.d.
6x32", 10x36", 10x50", 10x72", 12x72", 14x72" Norton Plain Cylindrical, belt and motor drive.
No. 14 Brown & Sharpe Plain Cylindrical, belt.

MISCELLANEOUS

Oil Gear Twin Twelve Hydraulic Broach, m. d.
No. 3B J. N. LaPointe Broach, m. d.
No. 2B J. N. LaPointe Broach, m. d.
No. 2, 2 Double, 3, 3 Double J. N. LaPointe Broaches, belt.
No. 10 Beaudry Power Hammer, belt.
50 ton Hanna Pneumatic Riveter.
100 lb. Bates Hammer, m d.
250 lb. Little Giant Hammer, belt.
6x6", 8x8" Atkins Kwik-Kut Power Hack Saws, belt and m. d
6x6" Peerless Power Hack Saw, m. d.
12x12" Racine Power Hack Saw, belt.
No. 3½, 4, 5 Greenerd Arbor Presses.
⅛" Landis 2 spindle B lt Cutter, m. d.
1" Landis Bolt Cutter, belt.
1½", 2" Acme 2 spdl. Bolt Cutters, belt.
American Bolt Heading Machine, belt.
Type E American Motor Operated Pipe Bending Machine, m. d.
12" Bignall & Keeler Pipe Machine, belt.
No. 0 Hilles & Jones Plate Straightening Rolls, m. d.
90" Bertsch Bending Rolls, 3/16" cap.
No. 2120 Niagara Power Squaring Shear, belt.
6 spindle 1" Acme Semi-Automatic Nut Tapper, belt.

100 KVA Gibb Welder, type SL36.
No. 8 Gaterman Oscillating Pneumatic Tapper, belt.
Nos. 1, 2, 2X, 2BG Garvin Automatic Tappers, belt.

TURRET LATHES, MFG. LATHES

No. 6C Potter & Johnston Auto., m. d.
Nos. 5A, 6A, 7A Potter & Johnston Automatics, s. p. d.
Ginholt Simplimatic, m. d.
Nos. 4, 6, 8 Warner & Swasey Turret.
Nos. 3A, 4 Warner & Swasey Univ.
3x36" Jones & Lamson, chucking.
3x36" Jones & Lamson, bar.
2 spdl. 3x36" Jones & Lamson, chucking.
2¼", 3" Acme Turret, bar.
26" Libby Turret, chucking.
Nos 9, 12 LeBlond Multi Cut.
LeBlond Crankshaft Lathe, m. d.
21", 24" Ginholt Turret.

ENGINE LATHES

14"x6' Lodge & S. Selective Head, m. d.
16"x6' Hendey Yoke Head.
16"x6' Lodge & Shipley, bowl head.
16"x8' Hendey, yoke head.
16"x8' Lodge & Shipley, bowl head.
18"x8' Lodge & Shipley, bowl head.
18"x10' Hendey, yoke head.
18—36"x16' Rahn-Larmon Sliding Bed Extension Gap, m. d., taper.
20"x8' American Geared Head.
20"x6' Hendey Geared Head.
20"x10' American Geared Head.
24"x12' Lodge & Shipley, bowl head.
27"x12' American, bowl head.
36"x18' American Heavy Pattern, taper attachment.
36"x18' LeBlond Geared Head.
41"x28' Bridgeford Geared Hd., taper.
42"x12' American Geared Head.

Write for complete Stock List.

265 Spring Grove Ave., CINCINNATI, O.

WRITE US—WE CAN LOCATE IT

Automatics, Nos. 0, 00 B. & S.
Brakes, 3', 4' D. & K. Finger.
Drills, 1, 2, 3, 4 & 6 spdl., ball bearing, Leland & Gifford, Avey; 20" and 25" Barnes b. g., p. f.
Grinders, No. 1½ Landis, universal; No. 2 Reid Surface with magnetic chuck; 26" Badger disc, ball bearing; 16x32 Landis crankshaft; No. 70 Heald, internal.
Blaisdell m. d., t. a. & chucks.; 8" Porter-Cable, air-chuck, m. d.; Fitchburg Lo-Swing.
Millers, No. 1½ Valley City, universal; No. 2 Kempsmith universal; No. 3 Kempsmith, plain & univ.; No. 34 Ohio pl.; 24" Cincinnati automatic.
Millers, vertical, No. 3 Beckers; No. 5B Becker.
Planers, 24"x6' & 8' Gray, 1 head.

SPECIALS

New No. 2 Monarch Surface Grinder, Excello Motor Driven Spindle; No. 3-A Warner & Swaser univ. turret lathe, chucking equipment, arr. m. d.; No. 1L Gisholt turret lathe, m. d.; 14' P. & W. Surface Grinder.

Hacksaws, Nos. 1, 2 Marvel; 6x6, Racine & Peerless shaping.
Keyseater, No. 3 Mitts & Merrill.
Lathes, 9"x4' South Bend, q. c. g.; 13"x8' Willard, s. q. c., collets & taper attch.; 14"x6' Hendey, taper attach. & collets; 16"x10' Seneca Falls, q. c. g.; 17"x8' LeBlond grd. hd., m. d.; 18" x 8' Whitcomb.
Punch presses, o. b. i. No. 3 R. & K. Nos. 1 & 1½ Bliss cam drawing.
Punch presses, horning; No. 39 Bliss.
Screw mchs., Nos. 0, 1, 3, 7, Foster; No. 2 W. & S.
Shapers, 14" to 28" G. & E., s. p. d.
Shears, 30" Bertsch corrugating.
Welders, arc, 200 Amp. USL; 800 Amp. Lincoln.

VICTOR MACHINERY CO., 126-128 S. Clinton St., CHICAGO, ILLINOIS

LOOK OVER THIS LIST

BORING MILLS

2½" bar Cleveland horizontal.
36" Bullard with side head, r. p.
36" Niles vertical, 2 heads.
60" Vertical Mill, 2 heads.
72" Wais & King vertical, 2 heads.

GRINDERS

No. 2 Brown & Sharpe surface.
Double disc grinders—all sizes.

LATHES

18"x6' L. & S. sel. geared head.
18"x10' L. & S. sel. grd. head, (3).
24"x12' Lodge & S. cone drive.
26"x19' Lodge & Davis l. c.
32"x12' Boye & E., cone head q. c.
36"x16' Lodge & Shipley s. p. d.

PRESSES

No. 4 & 5 Cons. & R. & K. (6).
No. 57 Toledo 18" bet. housing.

WELDERS

200 amp. Lincoln arc, m. d.
20 k. w. National spot, 36" arms.
25 k. w. National, 36" arms.
25 k. w. Thompson, 30" arms.

MILLING MACHINES

No. 2 Cincinnati univ. s. p. drive.
No 3 Kemp. univ. 3 step cone, d. b. g.
No. 1B Brown & Sharpe s. p. drive.
No. 34 Oesterlein plain, cone drive.
No. 3B Brown & Sharpe, s. p. dr.
No. 6 Becker vertical, rotary table.

HACK SAWS

2—8x8 Atkins, motor drive.
3—12x15 Racine, s. p. drive.
1—6x6 Marvel, automatic feed.

MISCELLANEOUS

Circle shear, No. 388 Toledo ⅜" cap.
Circle shear, No. 17 Niagara, 10 ga.
Bulldozer, No. 4 Rock River, m. d.
Brakes, 8', Chicago power 3/16".
Bolt cutter, 1½" Landis dbl. spindle.
Bolt cutter, 1½" & 2" Acme.
Gear cutters, Nos. 3, 4 B. & S.
Keyseater, No. 2 Mitts & Merrill.
Keyseater, No. 0 Baker.
Radial, 4' Hammond, sensitive.
Radial 6' Dreses, s. p. drive.
Straightening rolls, 54" H. & J.
Shaper, 32" Cincinnati, cone drive.

Jones—Buys, Sells and Trades—Send for Stock List

The Jones Machine Tool Co.
Front & Pike Sts., Cincinnati, Ohio

IN STOCK: READY TO SHIP!

Press: double crank, toggle, No. 408-B Bliss 84" between housings, 25" stroke.

Brake, power, 10' 1/4" Chicago Steel, motor driven.

Alligator Shear, No. 4 D & K.r.5".
Angle Roll, Kane & Roach.
Arc Welders, gasoline driven portable on trucks. 400 & 600 amps. Also m.d. 150, 200, 300 & 400 amp.
Beaders, No. 0612 Pexto.
Boring Mill, 24" Bullard, New Era.
Brake, Box & Pan, Chicago St. 8' 10 ga. m. d. 12" fingers.
Double Seamers, No. 3 Bliss.
Friction Saw, No. 0 Ryerson.
Gang Slitters, 48" Bliss. 32 & 36".
Grinders, Surface, No. 2 Dia.; No.
Millers, No. 1-A K. & T. sgl. overarm s. p. d.; No. 2 BS. K. & T.;
Multiple Punches, No. 10 and 12 Wells, 6' bet. hous.: W. & W., 48".
Presses Double Crank, Toggle, No. 3 Bliss 2½" stroke 32" betw. 93F Toledo dbl. crk., 66" betw. uprights, No. 137-C Stoll, 3" str. 48" bet. No. 102 Bliss-Cons. Overhang b. g. 2" stroke.
Radial Drill, 3' Cin.-Bick., m. d.

EXCEPTIONAL

Air Compressors, 10x10, m.d. (2).
Bending Roll, 8' ¾", drop end.
Drill, No. 3 Avey, 3 spdl. b. b., 12" overhang.
Grinder, disc, No. 24 Gardner 52" hor. m. d. with leading fixture.
Grinder, face, Diamond 84", m. d.
Grinder, 14x72 Norton cyl.
Hack Saws, 9x9" Peerless.
Millers, univ., No. 2 B. & S; No. 3 Hendey-Norton; No. 2 Clev. VH, d.h.; No. 3 B. & S. old style $375.
Press, No. 7 McDonald, OBI.
Press, coining, 800 ton, tie rod.
Press Brake, 10'x10 ga., 10⅜/16".
Shear, gate, 10'⅜" W. & W., 15" gap, motor drive.
Toggle Press, No. 14 Bliss.

2 LaSalle; No. 2 Wilmarth & M.
Hammer, 100 lb. Mayer little giant.
Horn Presses, No. 26 Bliss-Cons. 12" str. b. g. No. 43P Tol. No. 3H.
Ironworkers, Univ. Beatty Angles 3x3x⅜"; Schatz. 6"x4"x½" No. 16 Pels, 4"x4"x½"; No. 48 Braun.
Keyseater, No. 2 Mitts & Merrill.
Lathes, 16"x6' Cin.; 18"x8' B. & E. 18"x10' grd. head; 24"x12' Amer.
Mill, Ingersoll, 24x28x12'.
Radial Drill, 5' Fosdick.
Roller Die Mche, 7 paire sp., m. d.
Roller Leveller, 60", m. d.
Shaper, 24" Gould & E., s. p. d.
Shears, 156" Bertsch 5/16"—16" gap. 10⅜/16 Ohl; 6'10 ga. Pexto m.d.: 10' 10 ga.
Shears, Quickwork, 60" th., 14 ga.
Shears, Throatless ¼" m. d.; 12 ga., m. d.
Spot Welders, 7½, 25 and 35 KW.
Stake Riveter, 56" Rock River.
Turret Lathes, W. & S., 2-A, 4, 6.
Unisheers, Nos. 015 and 036.
Wells Bed Spring Machinery.

America's Largest Stock of Sheet Metal Machinery

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40"x14' Bement Planer Type Miller.
Nos. 57, 57½ & 58 Tol. Trim. Presses
2000 lb. B. & S. Brd. Drop Hammer.
1500 lb. Erie Board Drop Hammer.
1500 lb. sgl. frame steam forg. hammer.
Geometric Bolt Cut. up to ¾" B.M.D.
26"x11' Wickes D. B. G. Hvy. Duty
12"x10" Chi-Pneu. M.D. Air Comp.
No. 00 Baker Keyseater.
No. 2 H. & J. D.E. Bend Rolls 10'x⅜"
30"x14' Prentice g. h. Lathe, S.P.D.
12" Cox Pipe Cutting & Thread mch.
Lennox Rotary Bevel Shear, ¾" cap.
84" Niles Vertical Miller, B. D.
4' Fos. Rad. Drill, D.C. m.d. O.G.B.
92"x10' Lewis plate shear, 30" gap.
10' Garrison Pow. Press Brake, 16 ga.
300 lb. Bradley Upright Hammer.
10 ton Hand pwr. trav. Crane 46'8" span.
60" Betts Vertical Boring Mill.
100 ton Watson Stillman hy. wh. press.
20"x10' Hendey Lathe dbl. friction C.S.
No. 3 B. & S. Automatic Gear Cutter.
3½" Ajax iron bed Forg. & Upset Mch.
72" Bullard Vert. Bor. Mill D.C.M.D.
20" American back-geared Shaper.

Russell Machine Co., 438 Oliver Bldg., Pittsburgh, Pa.

BORING MILLS

60" and 48" Colburn; 52" Gisholt.
42" - 36" - 24" Bullard New Era Type Vertical Turret Lathes.
No. 0 G. & L. Hor., 3⅛" bar.
No. 6 Defiance Horiz., 4½" bar, table type.
Niles - Bement - Pond Horizontal Duplex, 4½" bar, table type.

MILLING MACHINES

Nos. 5, 4, 3, 2 Cincinnati, Plain.
Nos. 4, 3 & 2 Cincinnati Vertical.
No. 1 Kempsmith Universal.

LATHES

42"x24' Niles-Bement-Pond.
36"x16' Fitchburg.
28"x18' Chard.
26"x24' Putnam.
26"x12' Pittsburgh.

MISCELLANEOUS

No. 65 Heald Cylinder Grinders.
3' and 3½' Carlton, S. P. D.
14"x12" Ingersoll-Rand, Type ER 1, Motor Drive 500 cu. ft., Complete with 60 H. P. A. C. Motor.
8" and 6" Stoever Pipe Machines, Motor Drive.
10"x30" Webster-Perks Universal Grinder, complete equipment.
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8' Cincinnati-Bickford Triple Purpose Plain Radial Drill, M. D.
7' American Triple Purpose Plain Radial Drill, Motor On Arm.
6' American Triple Purpose Plain Radial Drill.
3' Cincinnati-Bickford, Single Pulley Drive.
60"x54"x16' Woodward & Powell Planer, three heads.
16" American Back Geared Crank Shaper.
No. 2 Mitts & Merrill Keyseaters.

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NEW 3 Phase Motors 1 to 20 H. P., 5 H. P.-------$55.75

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14"x6' Monarch, quick change.
16"x8' Hamilton, quick change.
18"x8'; 21"x10' South Bend, new.
12"x5' Cleveland - geared head.
24"x24' Prentice.

TURRET LATHES and SCREW MACHINES

No. 3 Wood- ilted.
1⅝" cap. Smurr & Kamen.
21" & 24" Gisholt, ⅝" capacity.
Acme, like new.

SHAPERS

16" B. G. Queen City.
20" Smith & Mills, 24" Ohio.
24" Barker.

DRILLS

Baush No. 1, multiple spindle.
32" Hoefer, sliding head.
6' ceiling.
4, 24" Foote-Burt, single base.

MILLING MACHINES

No. 1½ American plain.
No. 2 Brown & Sharpe, heavy.
24"x20"x8' Ingersoll.
No. 5 Becker vertical.

MISCELLANEOUS

Band saw, Clark, compound.
Gear miller, No. 1 Bilton.
Planers, Gray, 36" and 42".
Press, No. 2 Toledo O. B. I.
Press, Cam Drawing, No. 24 Toledo
Sand Blast, Boland.
Shear, Loy & Nawrath 3/16" cap. 10'.
Press, No. 75 O. B. Toledo.

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COLUMBUS Dept. H. OHIO

High Grade Machine Tools

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18"x10' AmericanGeared Hd.S.P.D.
36"x14' Boye & Emmes, cone, q. c.
32"x12' Bradford cone, Loose Chge.; like new.
36"x20' Bradford cone, Loose Chge.
24"x16' Lodge & Shipley sel. grd. hd. S. P. D.
36"x30' Lodge & Shipley Grd. Hd., S. P. D.; like new.
36"x18' American g. h., s. p. d.
24"x10' Bradford Geared Head Taper, Arranged Motor Drive.
28"x48"x10' Harrington, Slid. Bed.
20"x10' American Grd. Hd. S. P. D.
20"x8' Am. Grd. Hd., M. D., late.

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16"x52" Landis self contained.
No. 2 Brown & Sharpe Universal.
16"x48" Landis Crankshaft.
16"x48" & 72" Landis Crankshaft.
Type A Production Abrasive Finishing Nos. 50, 55, 60, 65 and 70 Heads.
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10"x52" Landis Plain, Self Con.
Rivett Internal Grinder.

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No. 6—60" Brown & Sharpe.
36BM Gould & F. Gear Rougher.
No. 3, 26" Brown & S. Gear Cutter.
No. 4, 48" Brown & Sharpe.
Nos. 1, 2, 4 Adams Farwell Gear Hb.
18-H Gould & Eberhardt Hobber.
6", 11", 18" Gleason Gear Generators.

Bolt and Pipe Threaders

½" Landis Double Spindle Lanco Hds.
2" Landis Double-Spindle.

Boring Mills

42" Bullard S. P. D.
36"-44" Niles-Bement-Pond Side hd. Mill, Rapid Traverse.
42" Niles Boring Mills, 2 heads.
14' Betts, Cone Drive.
60" Niles Boring Mill, 2 heads.

Milling Machines

No. 4 Cincinnati Universal, S. P. D.
No. 4 Cincinnati High Power Vert., S. P. D.
No. 3 Cincinnati Universal, cone dr.
No. 4 Cinti. High Pwr. Univ. S.P.D.
No. 2 & 3 Kempsmith Plain, M. D.
No. 3 LeBlond H. D. Plain.
No. 3 Kempsmith Universal.
No. 2 Rockford Universal, complete.
No. 3-B Milwaukee Pl., Dbl. O. A.
5B Becker Vertical Mill.
5" Pratt & Whitney Automatic.
18" Cincinnati Plain Mfg. Miller.
Briggs Manufacturing Miller.
No. 7-H Becker Lincoln type.
No. 1 Knight Miller and Driller.

Planers

30"x30"x8' American two heads.
30"x30"x16' Gray, two heads.
24"x6' Ohio.
24"x24"x14' Gray, box table.
42"x42"x10' Cleveland Openside, 3 heads, A. C., M. D.

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24" Cincinnati Pickford Upright, tap.
2½, 3, 3½, 6' Cinci.-Bick. S. P. D.
3, 3½, 4 American Trip. Pur. S.P.D.
3' Bickford Plain, S. P. D.
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No. 40 Natco Straight Line Multi.

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20" Ohio, motor driven.
16", 20", 24" Gould & Eberhardt motor drive, thru gear box.
16", 20" and 24" G. & E., cone drive.

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80 lb. Bradley Cushion Helve Hammer
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No. 2 Mitts & Merrill Keyseater.
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Rockford Horizontal Boring Mill—double spindle, equipped with T. & L. pulley for belt drive, size of platen 48"x48", No. 5 M. T., dia. of spindle 3", 2' travel on each spindle, geared feeds, automatic trip, maximum center of spindle to platen 4', table cross feed with automatic stop.

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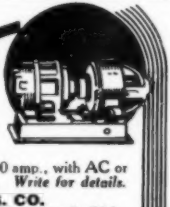

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1—No. 4-B Milwaukee Double Arm Miller, motor in base, rapid traverse and vertical attachment.
1—3' Morris Radial Drill, single pulley drive through gear box, box table.
1—3' Cincinnati Bickford Radial Drill, m. d. through gear box.
1—36"x16' Monarch Helical Geared Lathe, motor drive, taper attachment, double carriage.
3—No. 2 Brown & S. motor in base Surf. Grinders complete.
2—14x6 Hendey Grd. Hd. Lathes, taper att. over 23000 ser.
6x6, 9x9 and 13x16 Peerless motor drive Hacksaws..
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Nos. 23 & 34 New Britain chucking.
1½" & 1¾" Gridleys.

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3" Giddings & Lewis No. 0 m. d.
2½" N. B. P. knee type.
3" Lucas gear box, s. p. d.
3½" Landis No. 35 Floor Type.
3½" D & H. floor type.
5½" D. & H. floor type.

BORING MILLS, Vertical
24" & 36" Bullard rapid production.
72" Betts heavy duty.
42" and 60" Bullard r. p. t.
10' Niles, motor drive.
10' Pond, h. d., cone.

DRILLS, Radial
2½' Fosdick, s. p. d.
4'—6' Mueller, s. p. d.
5' Western m. d.
4' American, gear box, s. p. d.
6' N. B. P. right line, a. c. m. on arm.
6' Cincinnati B., gear box, s. p. d.
25 H. S. and Multiple Drill, etc.

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Nos. 50, 55 and 65 Heald.
15x15x72" & 6"x10"x36" Norton surf.
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6"x32" Norton, self-contained.
No. 103 Rivett internal.
84" Diamond, face.
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14x72" Norton, cylinder, s. c.
Universal, chucking, disk, etc.

GEAR CUTTERS
103"x20" G. & E., m. d.
60" B. & S., No. 6 spur.
No. 13 Brown & Sharpe, S. & B.
36" Fellows No. 6 shapers.
25" Gleason gear planer.
6" & 8" Gleason bevel & spiral (17).

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300 lb. Beaudry, m. d.
Nos. 6B and 2B Nazel.
200 lb. Bradley, cushioned helve.
400 lb. Bliss, belt drop.

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No. 3 Mitts & Merrill.

LATHES
20—14", 16", 18", 20", belt & g. h.
18"/36"x10' LeBlond gap, cone.
24"x12' Putnam, q. c. g., cone.
24"x16' Milwaukee t. a., cone.
32"x12' Bridgeford, grd. hd., q. c. g.
34"x12' L. & S., q. c. g. cone.
36"x32' LeBlond grd. hd. 2 carr.
36"x14' Putnam, grd. hd.
36"x30' Bridgeford, grd. hd.
45"x45' N. B. P. grd. hd.
50"x30' Pittsburgh, grd. hd., 2 car.

MILLERS, Production
No. 33 Kempsmith, 36" feed.
No. 33 Kempsmith, 50" feed.

MILLERS, Vertical
No. 5 Brown & Sharpe.
C, AB, 4B, 3, Becker.
No. 14 Garvin, table 20x48.

MILLERS, Plain
No. 4G Lelilond, grd. hd.
Cincinnati Nos. 3 & 4, grd. hd.
No. 2B Milwaukee, grd. hd. (2).
No. 2 Kempsmith Maximiller.
No. 2 Kempsmith, cone.

MILLERS, Universal
Nos. 1 & 1½ B. & S., cone.
No. 2A Brown & Sharpe s. p. d.

MILLERS, Planer Type
Ingersoll adj. rail, 32"x12'.

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18", 12" & 8" Saunders.
8" Jarecki, gear box, m. d.
2" Landis, cone.
2" Bignall & Keeler, m. d.

PLANERS
84"x60"x14' D. & H. openside.
48"x36"x16', N. B. P., box table.
42"x36"x12' & 24"x24"x6' Cinci., m. d.
17"x17"x4' Whitcomb, m. d.

SHAPERS
24" Stockbridge, a. c., m. d.
20" Rockford, gear box, m. d.
16", 20" & 24" G. & E.
24" American, gear box.

SLOTTER
18" Newton, equal new.

SAWS
6" Peerless univ., shaping.
No. 16 Higley, cold, m. d.

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8'x¾" Pyramid.
10'x¾" Cleveland pyr.
11' 7"x1" Wickes, m. d.
17'x1¼" Niles A. C. m. d.
12'x¾" H. & J. No. 4.
10'x¾" Bertsch, pyr.
16'x1¼" Wickes, pyramid type.

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Nos. 4 & 14 W. & S. heavy 1" cap.
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No. 2 Bardons & Oliver, 1" capacity
No. 4½ Bardons & Oliver.
14" Acme m. d., 1-3/16" cap.
21" and 24" Steinle, m. d.
18" and 26" Libby.

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1—144"x24" G. & E. Gear Cutter.
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10—FAWCUS Herringbone Gear Hobbers, for 84", 96", 144".
24' and 72" FAWCUS Spur and Herringbone Planers.
FAWCUS Hob Grinder.
52"x46"x8' NILES Vertical Miller.
48"x30' LODGE & SHIPLEY Lathe, cone drive.
30"x30x"x10' LIBERTY Planer, 2 heads, late type, m. d.
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Cleveland No. 1, 2½" bar.
Detrick&Harvey No. 0 3-7/16" bar.
Barrett No. 2.
Universal 2½", 3" bar.
Ryerson No. 12, 4" bar.

BORING MILLS — Vertical

Bullard 24", 42".
Niles 7-10' Extension, 2 heads.
Niles Bement Pond 44", 72".
Niles Bement Pond 36", 46"; side hd.
Putnam 42" 2 swivel heads.
Betts 90", 2 swivel heads.

PLANERS

Niles Bement Pond 60x60x32'; 4 hds.
Detrick & Harvey (Bethlehem), 84" widened to 100"x100"x24' openside.
Niles Bement Pond 72", 4 hds.

LATHES

Monarch 12x6 geared hd. taper att.
NBP 86"x19' geared head M. D.
Pittsburgh 50"x74', 50"x30' grd. hd.
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Bridgeford 36"x60' Boring.
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Springfield 24"x14',3-step pul.DBG.
Lodge & Shipley 24"x10',3-step cone.
Lodge & Shipley 30"x12'.

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Brown & Sharpe No. 2 Universal.
Cincinnati No. 2 Universal.
Cincinnati No. 2, 3, 4 Plain, SPD.
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Leland & Gifford 8 spdl. high speed, No. 2 Morse.
Avey 3 spdl. high speed No.2 Morse.
Barnes 3 spindle, camel back.
Edlund No. 2B, 2 spdl, direct m. d.
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Pratt & Whitney No. 12 mult. spdl.

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Barber Colman No. 3, 12 Hobbers.
Brown & Sharpe No. 3, 4, 5.
Brown & Sharpe No. 34.
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Gleason 24", 48" Gear Planers.
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Gould & Eberhardt 18" Hobber.
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Cleveland 5/8 7/8", 1½" single spdl., Models A. & B.
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Brown&S. No.00G high speed spdl.
Brown & S. No 00, No. 0, No. 2.
Gridley 7/8", 3/4", 1½" 4-spindle.

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Bryant No. 3 Internal.
Heald No. 50, 55, 60, 65 Internal.
Heald No. 70, 85 Internal.
Landis 10x24",10x36",10x52",10x72".
Norton 6x32",10x36",14x50",10x72".
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Diamond 84" face.
Heald No. 20, 8" Rotary.
Heald No. 72 Sizematic.

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Morris, 3' Pl. S. P. D.
Cincinnati Bickford 4', 6' Pl. S.P.D.
Reed Prentice 4' Pl. S. P. D.
Fosdick 5' Pl. S.P.D.
NBP 8' Plain.

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Cincinnati Acme 3½x36".
W. & S. No. 6; heavy cross slide.
Libby 26"; 7½" hole.

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51" Niles, 2 heads.
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14"x6' Prentice, geared head.
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19"x10' LeBlond, taper.
20"x40"x14' Rahn Larmon Series AG Sliding Bed Gap Lathe.
26"x14' Putnam.
40"x18' Prentice, raised to 52½".

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16" Milwaukee, cone drive.
28" American, cone drive.
20" Rockford, single pulley.
No. 6—60" B. & S. Gear Cutter.
72" B. & S. Gear Cutter.

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No. 1½ American.
No. 4 Cincinnati.
No. 4 LeBlond universal.

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10'x10 gauge Ohl, motor driven.

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Nos. 4 and 6 Warner & Swasey.
2-A W. & S., bar and chuck.
6¼" Gisholt, motor driven.

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3" Acme Bolt Cutter, Landis hd.

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Lathe, 13x20" Adams short cut, s.p.d.
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Press, No. 1½S Robinson gap frame, double crank.
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Press, No. 5 Michigan, o. b. i.
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Shear, square, 30" Niagara.
Shear, power, No. 242 Niagara.
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2—No. 3 Brown & Sharpe Milling Machines
Taper nose spindle, power rapid traverse. Exceptional condition.

2—15" Sellew Universal Shapers
Swivel knee with tilting side, Power down feed, knee support.

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Self-contained motor drive. Condition excellent.

1—8x12 Rolling Mill with roller bearings.

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⅝", ¾", 1" and 2" Cleveland.
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1" and 1½" New Britain.
Nos. 5A and 6A Potter & Johnston.
Nos. 24 and 33 New Britain.
10" Bullard Continumatics.

BROACHES

10 ton Metalwood hydraulic.
15 ton Oilgear hydraulic.
No. 3 Oilgear hydraulic.
No. 3L Lapointe hydraulic.
Nos. 0, 3 and 4 Lapointe screw.

COMPRESSORS

92', 7"x8" Ingersoll Rand.
136', 8"x8" Ingersoll Rand.
255', 10"x10" Ingersoll Rand.
369', 12"x10" Chicago.
446', 14"x9"x10" Bury 2 stage.
655' Union 2 stage.

DRILLS

Sensitive:—All makes and spindle combinations.
21", 24", 28", 42" Cincinnati.
20", 23", 26" Rockford.
21", 25", 28" Superior.
Nos. 216, 314 and 417 Baker.
20" Colburn No. 2, 1 and 4 spindle.
22" Barnes all geared 2 spindle.
3' and 3½' Cincinnati Bickford radial.
3' Morris radial.
4' Hammond radial.
4' Mueller radial.
4', 5', 6' and 8' Western radial.
Nos. 12, 13, 14 and 30 Natco multiple.
24 spindle, No. 3 Bausch multiple.
26 spindle, No. 31D Fox multiple.
Nos. 00S & 1S Garvin duplex.
5 spdl. Detroit automatic.
2 spindle P. & W. gun barrel.

GEAR CUTTERS

No. 6, 7 and 715 Fellows.
Nos. 16 HS, 18H and 24H G. & E.
No. 12 Barber-Colman.
No. 5A Lees Bradner.
Nos. 3 and 4 Brown & Sharpe.
6" Gleason bevel.

GRINDERS

Norton:—6"x32" to 14"x72".
Landis:—6"x18" to 16"x53".
Nos. 2 and 4 Brown & Sharpe univ.
10"x36" Thompson universal.
12"x36" Bath universal.
Nos. 2 and 3 Ohio tool.
No. 2 Cincinnati centerless.
No. 2 Brown & Sharpe surface.
No. 3 Abrasive surface.
Nos. 70 & 72 Heald internal.
No. 4A Landis crank.
30" and 53" Besly disc.
Pratt & Whitney worm.

LATHES

14"x6' American, m. d.
16"x8' American, m. d.
18"x8' Lodge & Shipley, s. p. d.
18"x8' American, m. d.
20"x8' American, s. p. d.
11"x4' LeBlond Mfg.
20"x8' Wicks Mfg.
8" Sundstrand stub.

MILLS, BORING

24" & 34" Bullard New Era.
34" Colburn.
42" Detrick & Harvey.
60" Gisholt.
72" Niles Bement Pond.
100" Betts.
24" Cleveland horizontal.
3" Rockford horizontal.

MILLERS

Nos. 1½ B. S. and 2A Milwaukee.
Nos. 2, 2M, 3 and 4 Cincinnati.
Nos. 1½, 2 and 2½ Rockford.
Nos. 1½, 2 and 3 Brown and Sharpe.
Nos. 2, 2½ and 4 LeBlond.
No. 4 Hendey.
No. 4 Kempsmith Maximill.
No. 3A Brown & Sharpe universal
No. 3 Brown and Sharpe vertical.
No. 6 Becker vertical.
24" and 48" Cincinnati duplex.
24" and 48" Cincinnati automatic.
24" and 48" Newton rotary.
36" Ingersoll rotary.
48" Ohio tilted offset.
26"x24"x6' Ingersoll adj. rail.
48"x48"x8' Beaman & Smith O. S.

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try and contains an unusually high percentage of
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24" and 34" Bullard New Era.
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Nos. 2, 3 and 4 Foster.
18" Libby.
21" and 24" Gisholt.
2½" and 3" Jones & Lamson.

PLANERS
24"x24"x6' Liberty openside.
24"x24"x6' Woodward and Powell.
24"x24" Cincinnati crank.
26" Lynd Farquhar openside.
30"x30"x12' Cleveland openside.
32"x32"x12' Niles.
36"x36"x8' Gray.
36"x36"x10' Cincinnati.
48"x36"x10' Liberty openside.

PRESSES
No. 1 Toledo OBI.
No. 3 Moore OBI.
No. C4 Ferracute OBI.
No. 75 Toledo openback.
150 ton Farracute coining.
400 ton Hamilton coining.
25 ton Henry and Wright dieing.
Nos. 55, 56, 57½ Toledo ss.
Nos. 64, 65, 67 Consolidated.
No. 74½ & 78½ Bliss s. s.
No. 8-7 Zeh and Hahneman.
No. 247 Hamilton, 150 ton s. s.
No. 301½ Hamilton, 400 ton s. s.
No. 30½ Bliss arch frame.
31" No. 91 Bliss dbl. crank.
34" Bliss No. 4 dbl. crank.
32" No. 90C Toledo double crank.
48" No. 23C Bliss double crank.
70" Ferracute SNG107 double crank.
Nos. 1½, 3½A, & 5A Bliss toggle.
No. DDG54 Ferracute drawing.
No. 266 Consolidated drawing.
Nos. P1, P2, P3, P4 & PG4 Ferracute punching.
No. 94 Consolidated punching.
No. 22 Michigan horning.
50 ton, No. 7 Z. & H. percussion.
3, 8 and 20 ton General Flexible.
15 and 25 ton Oilgears.

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2½" Garvin.
2½" Pratt & Whitney.
18" Niles.
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¾"x¼" Long & Alstatter 5" throat.
¾"x¼" Wickes, 12" throat.
1¼"x1" Long & Alstatter 12" throat.
1¼"x1" Cleveland horizontal.
107" Frech gang.

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Nos. 2A, 3A, 4A, 5A high speed.
Nos. 80, 80B & 101 Grant.
20 ton Allen air.
20, 30, & 50 ton Hanna air.

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6"x6" Racine hack.
6" Lea Simplex cold.
Racine abrasive cut off.
36" Tannewitz band.
Grabo metal saw table.

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16" Gould & Eberhardt.
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20" Gould and Eberhardt.
24" Potter and Johnson, m. d.
24" Gould and Eberhardt.
24" Walcott, m. d.
24" Milwaukee.
26" Stockbridge.
28" Columbia.

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Nos. 1, 2, 2X, 2BG Garvin.
4" Rickert Shafer radial.
4" Rickert Shafer vertical.
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¾" Webster and Perks 2 spdl.
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1½" Geometric.
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1", 1½" & 2" Landis 2 spindle.
3" Acme single.

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16x8 Monarch Quick Change, D. B. G. and Double Friction C./S.
18x8 Reed Standard with C./S. and 12" Ind. chuck.
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No. 1½ Knight Vertical Mill, P. F.
No. 2B Brown & S. pl. Mill, s. p. d.
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1—No. 3 Kempsmith Universal.
1—No. 2 Cincinnati Universal.
1—No. 2 Kempsmith Universal.
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1—No. 2 Colburn four-spindle.
1—No. 4-D Colburn.
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2—No. 12 P. & W. multiple spindle.
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1—56"x56"x14' Niles-Bement-Pond.
1—56"x56"x14' Gray.
3—72"x72"x12' Pond.

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1—No. 6 Hilles-Jones Guillotine.

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1—18x96 Norton Plain.
1—14"x96" Norton Plain.
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Grinders, 84" Diamond Face.
Grinders, 10x72 B. & S., & Norton.
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Headers, No. 4 Manville DSSD.
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Miller, No. 701 Bliss Flat Edge Trim.
Miller, No. 500C Manville Bolt Trim.
Millers, No. 2, No. 3 and 4 Cin. h.p.
Miller, No. 3B Brown &Sharp plain.
Miller, No. 2 Cincinatti Universal.
Miller, No. 1A Mil. DA Vertical.
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Press, EG 54 Ferracute 400 ton.
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Grinder, No. 3 Wilmarth & Morm.
Grinder, No. 16 Blanchard Surface.
Lathe, 16"x6' Hendey Geared Hd.
Lathe, Turret, No. 6 W. & S. univ.
Mill, No. 3 Van Norman, m. d.
Mill, No. 4 Hendey Univ., All Grd.
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Press, No. 5 Toledo O. B. I.
Press, No. 173B Consolidated Double Crank.
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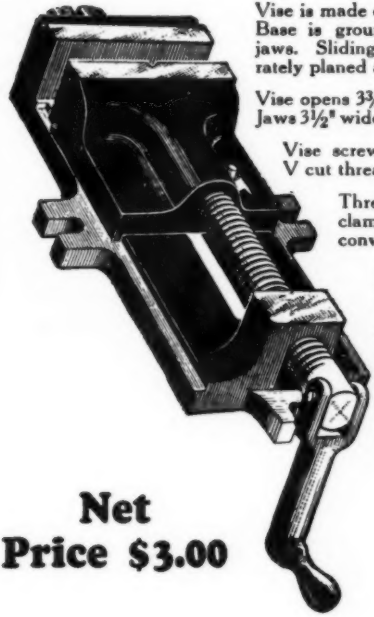

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1—300 KW G. E.—Curtis—230 v. D. C. Non-Cond.

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1—75 HP G. E. type ATI synchr., 1PF 1200 RPM.
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1—100 HP G. E. type I-K Induc., 1800 RPM.
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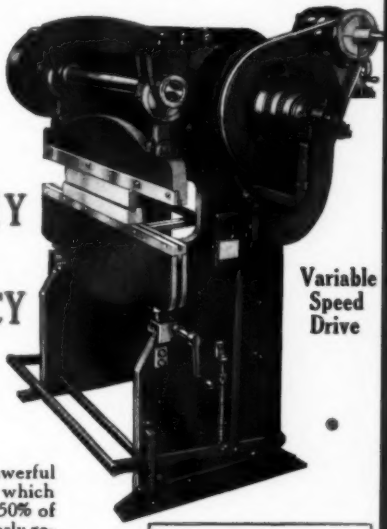

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